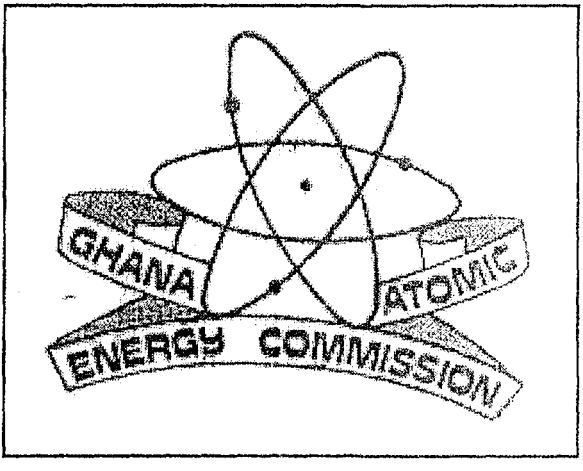
GHANA ATOMIC ENERGY COMMISSION

AT A GLANCE



GAEC
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LEGON-ACCRA
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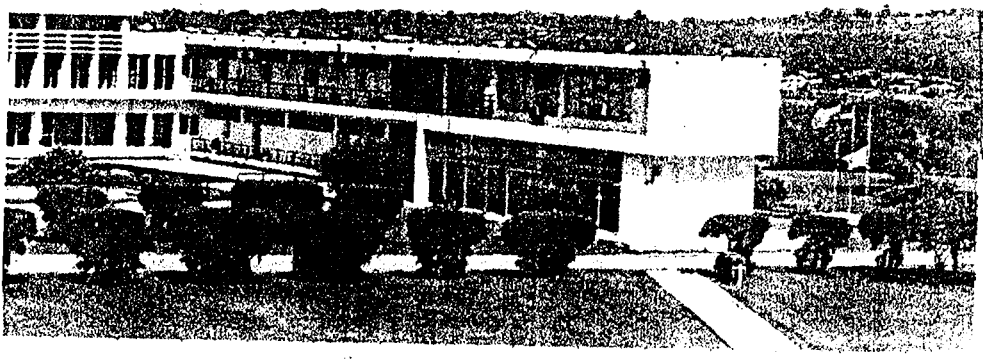

Back view of Administration Block

GHANA ATOMIC ENERGY COMMISSION

AT A GLANCE

P. O. Box 80
Legon-Accra

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1. BRIEF HISTORY

In Ghana, the use of radioisotopes started in 1952. At that time radiostrontium was used in experiments on monkeys. Fallout monitoring service was undertaken by the Physics Department of the University College (now University of Ghana, Legon) on behalf of the Ministry of Defence in 1958. By the close of 1959 work in radioisotope application in Ghana had sufficiently gained ground in a number of institutes so the establishment of a Radio-isotope Unit was desirable. Proposals for the establishment of such a Unit were made and were approved by the National Research Council and the Health Physics and Radioisotope Unit was established.

In 1961, the Ghana Government decided to undertake "The Ghana Nuclear Reactor Project". The project was intended to introduce nuclear science and technology into the country and to exploit nuclear energy in its peaceful applications to aid in national development. The central facility of the project was to be a research reactor designed for research, training and production of radioisotopes.

From a long-term point of view, it was hoped that the research reactor facility would provide the means for preparation for the development of manpower and promote plans for the introduction of nuclear power for electricity in the country. The Ghana Atomic Energy Commission was established to realise the above objectives.

2. ESTABLISHMENT AND FUNCTIONS

The Ghana Atomic Energy Commission (GAEC) was established by an Act of Parliament (Act 204) in 1963. Its main

functions include the promotion, development and utilization of the peaceful application of nuclear techniques for the benefit of Ghana. In pursuance of these objectives, the Commission has established institutes under which the research activities are carried out.

3. LOCATION

The GAEC is located about 24 kilometers (15 miles) from the Centre of Accra and is about 6 km off the Legon-Madina road. The Residential area, comprising accommodation for Senior Members, Senior and Junior staff, is about 2km from Dome and 3 km from Kwabenya village. Site, the area on which is situated the Institutes and most of the facilities, is 2km from Haatso.

The Residential Area

The Department of Health, Domestic Bursary, Police Station, Main Security Office and some services are located in the Residential Area. The GAEC provides accommodation and boarding to participants of training courses and other guests. There is a Club House and a dining hall which is used for religious and other social functions. Various denominations worship in various premises at the residential area and a visitor would always find a place to worship.

4. STRUCTURE AND ORGANIZATION

The Management Board of the Commission is made up of a Chairman and 11 other members representing the Universities, Government Ministries and Departments, Farming and Business Communities and Specialists in major scientific and technological disciplines. The Board is answerable to the Minister of Environment, Science & Technology (MEST). The organogram of GAEC is shown in Fig. 1.

GAEC has a Secretariat where most of the central administrative functions are carried out. Under the Secretariat are the following: General Administration, Finance: Accounts, Purchasing & Stores, Estates, Transport, Security, Clinic, School, National Radioactive Waste Management Centre and Library.

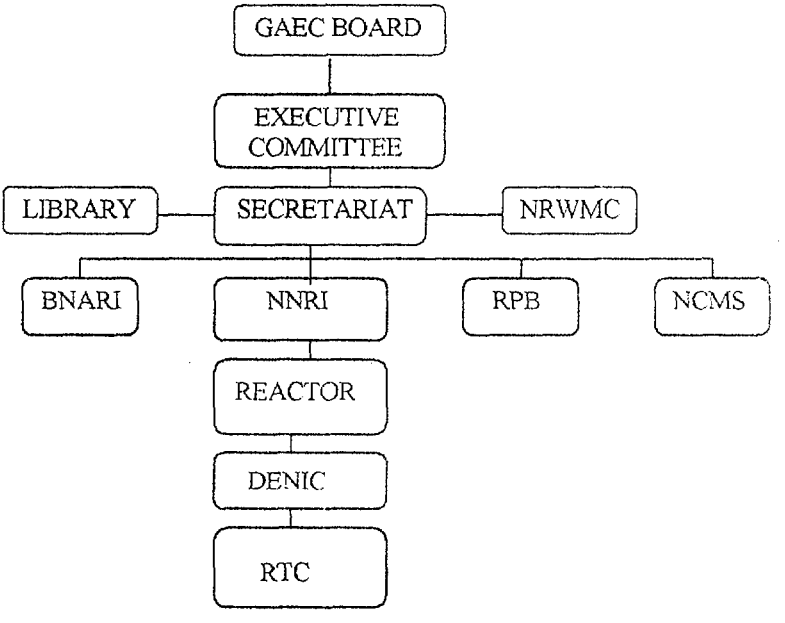

Fig. 1: Organogram of GAEC

The Executive Committee is the body that oversees the implementation of the decisions and policies made by the GAEC Board. The composition of the Committee is as follows: Executive Secretary, Deputy Executive Secretary, Director-NNRI, Director-BNARI, Director-RPB, Head-Accounts and Head-Audit.

5. STAFF STRENGTH

The Commission has a total staff strength of 398. Of these 100 are of Research Grade, and 298 Technical, Administrative and Supporting Staff.

6. INTERNATIONAL RELATIONS

Several international agencies and bodies support programmes of the Commission and its institutes and centres. Notable among them are:

a. International Atomic Energy Agency (IAEA)
b. United National Development Programme (UNDP)
c. Food and Agriculture Organization (FAO)
d. International Institute of Tropical Agriculture (IITA), Benin
e. African Countries within the African Co-operation Research Agreement (AFRA) Programmes.
f. International Centre for Theoretical Physics, Trieste, Italy.
g. Argonne National Laboratory , USA.

The main external sponsor of researches and programmes of the GAEC is the International Atomic Energy Agency (IAEA). Through the IAEA, the Commission has trained and is training its personnel at various Universities and Institutions outside Ghana. The personnel of GAEC take part in the programmes of the IAEA. Ghana has been a member of the IAEA since September 1960 - the third country from black Africa to be admitted as a member of the Agency. She has also served on the Board of Governors of the IAEA five times. Ghana is represented on various committees on nuclear, radiation and

waste safety of the IAEA and on the African Co-operation Research Agreement (AFRA) Programmes. More importantly, Ghana has always been represented at the IAEA Annual General Conference which enables the Commission to participate in the deliberations and thereby influences decision-making in terms of policy matters put forward by the Board of Governors of the Agency.

7. LINKAGES WITH UNIVERSITIES AND RESEARCH INSTITUTES IN GHANA

Scientists of GAEC are resource persons for our Universities. Over the years they have been helping in the training of our scientists in the Universities. They give lectures and help supervise project works for B.Sc., M.Sc. or Ph.D. degrees. They have research collaboration with other research institutions in the country as well as other institutions e.g. Council for Scientific and Industrial Research, Cocoa Research Institute, Ghana Standards Board, Environmental Protection Agency, Animal Research Institute etc.

8. RADIOACTIVE WASTE MANAGEMENT CENTRE

The Commission established the Radioactive Waste Management Centre in June, 1995. The Centre is to engage in radioactive waste safety operations at the GAEC and in Ghana, which is a Class C country by IAEA classification. This is because we generate radioactive waste from medical, industrial and research applications of radioactive materials as well as from reactor utilization.

It will operate a radioactive waste facility for Ghana. This means it will help waste generators to manage their wastes, treat, store and transport to the Central Waste Management facility at GAEC for conditioning, storage and final disposal.

It is the duty of the Centre to help users of ionizing radiations to translate the Regulations and Guides of the Radiation Protection Board into practice.

The Centre operates a sealed source computerised Registry which is an inventory of all sealed radioactive sources in use and out of use in Ghana.

9. GAEC LIBRARY

The GAEC Library is situated on the first floor of the main administration building. The function of the library is to serve as the main resource base for information in nuclear science and technology in Ghana. The resources of the library include journals, books, conference proceedings and other reference materials. To complement its resources, the library is able to offer computer-based literature searching service.

Databases currently available are:

1. The International Nuclear Information System (INIS)
2. Ghana Agricultural Research Information (GHARI)

For more information about any of these services contact

Tel. No. 406908 or 400310 Ext. 109

10. RESEARCH INSTITUTES AND CENTRES OF GAEC

Each institute has a Management Board appointed by the Management Board of the Commission to manage its affairs as a semi-autonomous body and to ensure that research programmes answer the needs of the user-agencies.

Presently GAEC has 3 Institutes and 5 Centres:

1. The National Nuclear Research Institute (NNRI)
2. Biotechnology and Nuclear Agriculture Research Institute (BNARI)
3. Radiation Protection Board (RPB)
4. National Centre for Mathematical Sciences (NCMS)
5. Radiation Technology Centre (RTC)
6. Reactor Centre (RC)
7. National Radioactive Waste Management Centre (RWMC)
8. Digital Electronic and Nuclear Instrumentation Centre (DENIC)

INSTITUTES

11. THE NATIONAL NUCLEAR RESEARCH INSTITUTE (NNRI)

This is the oldest Institute. It was established in 1963 by Act 204. Currently, besides the Departments of Physics, Chemistry and Nuclear Engineering, the Institute has under it, the Reactor Centre, the Radiation Technology Centre and Digital Electronics and Nuclear Instrumentation Centre.

Organizational Chart of NNRI

MANAGEMENT BOARD

DIRECTOR
- Administration

-- SCIENTIFIC DEPARTMENTS

-- NUCLEAR ENGINEERING DEPARTMENT

Divisions:
- Waste Management & Radiation Protection
- Reactor Physics
- Mechanical Engineering
- Electronic Engineering
- Materials & Met. Engineering
- Non-Destructive Testing
- Structure Studies

---- PHYSICS DEPARTMENT

Divisions:
- Health and Medical Physics
- X-ray Fluorescence Laboratory
- Solid State Physics
- Neutron Activation Laboratory

---- RADIATION TECHNOLOGY CENTRE

Divisions:
- Research Unit
- Operation & Dosimetry
- Maintenance

---- DIGITAL ELECTRONICS AND NUCLEAR INSTRUMENTATION CENTRE

Divisions:
- Research & Development
- Maintenance

------ CHEMISTRY DEPARTMENT

Divisions:
- Radiopharmacy
- Analytical Services
- Agrochemical Residues
- Radiochemistry

Important facilities operated by the Institute are:

a) **The 30 kW Ghana Research Reactor GHARR-1**. The Reactor provides neutrons for activation analysis (NAA) with the help of which samples are analysed for their elemental contents and concentrations. NAA enables the NNRI to give services to the following sectors of the our economy: Mining, Industrial, Medical, Agricultural and Geological to mention a few. The reactor is also available for training future nuclear scientists and engineers for the generation of electrical power. Universities and Research Institutions in and outside Ghana are welcome to use the reactor for various researches. Further the reactor will be used to produce short lived radioisotopes for tracer technology for Industry and Agriculture.

b) **The Radiation Technology Centre (RTC)** houses a Gamma Irradiation Facility which utilizes a 1.85 PBq cobalt-60 radioactive source for the irradiation of various materials. Presently RTC is engaged in commercial sterilization of medical products and in the preservation of agricultural produce and food items.

c) **The Non-Destructive Testing (NDT)** Unit of NNRI provides services to industry. It helps test welds of boilers, tankers, ships and so on to ensure there are no discontinuities or defects. In NDT, X-rays, ultra sound, magnetic particle and liquid penetrants are used to ascertain the integrity of welds, casting and forging. The NDT has provided services to such companies as DL Steel, MotherWell Bridge Ltd., Tema Oil Refinery, GNPC, Goil, WTC and so on.

d) **X-ray Fluorescence (XRF)** Unit. X-ray fluorescence analysis is a non-destructive physical method used for elemental analysis of solids and liquids. The specimen is irradiated by an intense x-ray beam and the sample in turn emit fluorescence x-rays that characterize the elements contained in the sample. Using the peak energies of the x-ray spectrum produced, the elemental composition of the sample can be identified and quantified. The unit is providing services in analysing mineral ores, industrial raw materials and in environmental pollution studies. Analytical services are also being offered to other sister African countries. There is in operation now a Memorandum of Understanding between NNRI and The Laboratoire National de la Santé Publique (LNSP) of La Cote D'Ivoire. This allows for exchange of expertise, access to facilities, joint research projects and collaborative in the use of Energy Dispersive X-ray Fluorescence (EDXRF) and Reactor Neutron Activation Analysis (RNAA).

e) **Solid State Nuclear Track Detector**. A major activity of the section is monitoring earthquake tendencies in Accra by radon monitoring using nuclear track detection methods.

f) **Digital Electronics and Nuclear Instrumentation Centre (DENIC)**. DENIC personnel maintain all nuclear and electronic instruments at GAEC. They also give services to the Universities, Crop Research Institute, Tema Lube Oil Co., GNPC, Ministry of Trade and some hospitals. Moreover they are the sole agents for the maintenance and repair of gamma cameras and UV-Scanners in the country. They also do installation and servicing of computers and other peripherals.

g) **National Pesticide Formulation Control (NPFC)**. The Chemistry Department of the NNRI is involved in the NPFC programme. This programme is to ensure that quality and efficacious pesticides are approved for use in the country. This utilises GAEC laboratory equipment based at the Chemistry Department to ascertain the claims of pesticide manufacturers and importers of the quality of their products.

The programme will boost Ghana's agricultural production. The programme is being sponsored by the Ghana Government and supported under Technical Co-operation (TC) by the IAEA and the Food and Agriculture Organisation (FAO).

h) **Mechanical Workshop**. The Mechanical Workshop of the Ghana Atomic Energy Commission comprises a Machine Shop, Fabrication Shop, Refrigeration and Liquid Nitrogen Section and a Design and Draughting Section.

Machines in the Workshop include:

Turret Lathe, Horizontal Milling Machine, Shaping Machine, Cylindrical Grinder, Surface Grinder, Power Saw, 4 Lathes, Pillar Drilling Machine, Radial Drilling Machine, Sensitive Drilling Machine, Vertical Milling Machine, Lapping Machine, Pipe Bending Machine, Tools Grinder, Movable Welding Generator and Liquid Nitrogen Production Plant.

The workshop is manned by qualified technicians, a number of whom have several years of working experience. The workshop is managed by a Mechanical Engineer with experience in Machine Design and Manufacturing.

Our services include Spare parts design and manufacture. Product design and manufacture; Reconditioning of spare parts, Construction of steel structures, Repairing of Refrigerator Air Conditioner repairs and supply of Liquid Nitrogen. At GAEC Workshop, efficiency of work is stressed. Our clients are assured of quick and quality service.

Contact us for excellent engineering services through the following address.

The Workshop Manager
Ghana Atomic Energy Commission
P. O. Box 80, Legon

i) **Radiotherapy Facility**. Since January 1995, the Institute has been supervising the building of an ultra-modern Radiotherapy Centre at the Korle-Bu Teaching Hospital. The cost of construction of the building alone was around one billion cedis. Funds are being made available for this project by the government of Ghana through the Ministry of Health. The IAEA provided all equipment, training and expert services for the project through the Ghana Atomic Energy Commission.

The facility is being used for the treatment of cancer. It is expected to be commissioned by the end of May, 1998. Groundwork for a similar facility to be established in Kumasi has also started.

12. BIOTECHNOLOGY AND NUCLEAR AGRICULTURE RESEARCH INSTITUTE (BNARI)

The Biotechnology and Nuclear Agriculture Research Institute (BNARI) was established in September 1993 by the Atomic Energy Commission Amendment Law, PNDC Law 308 of 1993. Prior to that it existed as the Department of Biology, Food and Agriculture in the National Nuclear Research Institute (NNRI), then the only institute of the Ghana Atomic Energy Commission (GAEC). Since then it has developed to be the leading research and development institution in nuclear agriculture and biotechnology in the country.

BNARI is engaged in peaceful applications of nuclear energy and modern biotechnology for the improvement of agricultural production through better use of water and fertilizers, induction and breeding of new and better varieties of food crops, control of insect pests and diseases, increasing the production of quality crops and healthy animals, protecting and preserving agricultural produce in the field and during storage.

The paramount objective of the institute is to help Ghana attain self-sufficiency in agricultural production, food security in both crops and livestock products and economic development so as to alleviate malnutrition, hunger and poverty. To achieve this noble aim nuclear and biotechnology techniques are being used together with appropriate or improved conventional farming practices to conduct research and development activities to support national agricultural projects for:-

- increasing food production using rapid

micropropagation.

- increasing biodiversity through induction of economic varieties by mutation breeding.
- protection of food and industrial crops and livestock against insect pests and diseases using integrated pests and vectors management including SIT, natural enemies.
- increasing food security through reduction of post-harvest losses.
- improving health care through radiation processing food and medical supplies and pharmaceutical products.

Organizational Chart of BNARI

MANAGEMENT BOARD

DIRECTOR
- Administration
- Scientific Support Services

SCIENTIFIC DEPARTMENTS

DEPARTMENT OF ANIMAL SCIENCE
Divisions:
- Entomology (Agricultural, Medical and Veterinary)
- Animal Nutrition & Agro-industrial by-products study
- Reproductive Physiology and Production
- Animal Health and Veterinary Services
- Biopesticides

DEPARTMENT OF FOOD SCIENCE AND RADIATION PROCESSING
Divisions:
- Microbiology
- Food Analysis
- Human Nutrition
- Medical Sterilization
- Industrial Processing

DEPARTMENT OF PLANT AND SOIL SCIENCES
Divisions:
- Soil Physics and Conservation
- Soil Chemistry and Fertility
- Plant Biotechnology (Physiology and Tissue Culture)
- Agronomy and Breeding
- Plant Protection (Pathology/Virology)
- Genetics and Molecular Biology

Significant Research and Development Findings

- Laboratory scale studies on irradiation dose requirements to control losses in various local food commodities including cocoa beans, cowpeas, maize, yams, onions, smoked fish, salted dried fish ("koobi"), garden eggplant fruits, and mangoes have been completed and will soon be used in semi-commercial pilot studies.

- The success of the laboratory scale studies encouraged the Government of Ghana to acquire a pilot-scale multipurpose gamma irradiator to facilitate techno-economic feasibility studies on radiation processing technology in Ghana. The irradiator was commissioned on 8th March 1995.

- Draft Regulations for Irradiated Foods, a pre-requisite working paper for test-marketing of irradiated foods in Ghana, as been prepared for the consideration and approval by the Ghana Standards Board.

- Through public education programmes, some degree of awareness about irradiation treatment of food and medical supplies have been created among Ghanaians.

- Appropriate gamma radiation doses for decontamination of medical devices and supplies have been determined and are being used by the Radiation Technology Centre for semi-commercial sterilization of hypodermic needles, gauze, cotton wool, disposable syringes, sanitary pads etc.

- Insect Sterilization Technique for the control of insect pests and vectors particularly tsetse flies has been developed and being improved for area-wide control of riverine tsetse flies in Ghana.

- Artificial media for tissue culturing some economic plants like plantain, banana, yams, pineapple, cassava etc. have been developed and are being improved and made cheaper for commercial usage.

- Developed some cassava varieties of "Bosom nsia" which are relatively tolerant to African Cassava Mosaic Virus (ACMV) through induced mutation breeding.

Technologies Ready for Transfer to User-Agencies

- Weaning Technique for tissue-cultured seedlings.
- The minisett technique for rapid multiplication of yam planting material is being extended to farmers.

- Production of sterile males of *Glossina palpalis palpalis* and G. *tachimoides* for the control/eradication of riverine tsetse flies. Studies are now being conducted to promote community participation in the deployment of the sterile flies for area-wide control.

Technical Services

The Institute offers analytical services on food items and microbial agents. It also provides consultancy services on plant biotechnology and nuclear agriculture.

13. RADIATION PROTECTION BOARD (RPB)

The RPB is the Sole Regulatory Body in Ghana on Nuclear Radiation and Waste Safety and has authority under the legislative instrument, LI 1559 of 1993 to authorize, license, inspect and control all activities and practices involving radiation sources, radioactive materials and X-rays used in hospitals in Ghana. RPB issues Regulations and Codes of Practices.

The Organizational Structure of RPB is shown below:

Organizational chart of RPB

MANAGEMENT BOARD

DIRECTOR
- Administration
- Head of Laboratories

LABORATORIES

Divisions:
- Radiation Metrology Laboratory
- Food & Environmental Laboratory
- Occupational Radiation Protection Laboratory

Technical Services

Technical services are offered to individuals and organizations who are involved in the use of radiation sources and radioactive materials. The nature of the service range from consultancy on the safety in the design of diagnostic medical X-ray facilities

and housing radiation sources and radioactive materials; safety assessment; monitoring of imported foods for radioactive contamination; monitoring of radiation workers in Ghana, and calibration and standardization of radiation instruments.

a) **Personnel Monitoring Services**

To assist operating organizations to fulfill the requirements spelt out in the LI 1559, the RPB offers a centralized Personnel Monitoring Services to persons working with diagnostic medical x-ray sources in the hospitals and other radiation workers in industry, research and teaching.

The Personnel Monitoring Service is offered through the use of a special radiation device called the Thermoluminicence dosimeter (TLD).

Personnel Monitoring Statistics

Area of Activity	# of Personnel	# of Units
i) Medicine		
- Diagnostic Radiology	515	200 X-ray Units
- Nuclear Medicine	12	1 Nuclear Medicine
- Radiotherapy	17	1 Brachytherapy
ii) Industry	80	8
iii) Research	137	14

b) **Food and Environmental Monitoring**

All food items imported into the country are analyzed by the RPB. The analysis covers the measurement of radionuclide contamination in food items such as beef, poultry, milk, and milk products etc. Appropriate certificates are issued to declare the wholesomeness of the food items before permission is granted for clearance from the Port. Some local food items such as cocoa and cocoa products to be exported are also analyzed upon request.

Apart from food items, environmental samples such as soil, aerosols, vegetation and water are also analyzed to ensure that the environment is not contaminated with man-made radioactive materials.

Food Monitoring Statistics

i) Type of Food Samples

Meat, Milk, Cocoa and Cocoa products, tobacco, etc.

ii) Average No. of samples per year - 21,000
Average No. of certificates per year - 700

c) **Calibration of Radiation Instruments.**

The Metrology Laboratory of the RPB houses a Secondary Standards Dosimetry (SSDL) equipment for the calibration and performance testing of radiation measuring instruments and the TLD badges issued to radiation workers.

Education and Training

The Board is required to disseminate and provide knowledge about the protection of man from the harmful effects of ionizing radiations. It is also the responsibility of the Board to provide advice and information to end-users and to inculcate at all levels of management and operation, staff charged with the use of ionizing radiation, a commitment to the principles of radiation protection.

Institutions and personnel that have benefited so far include Radiologists, Radiographers, Reactor staff, CEPS, EPA and some personnel from the Base Workshop. RPB is also involved in IAEA sponsored fellowship programmes and regional training courses for personnel from sister African countries.

14. NATIONAL CENTRE FOR MATHEMATICAL SCIENCES (NCMS)

The National Centre for Mathematical Sciences was established by the Ghana Atomic Energy Commission in 1995 and was officially inaugurated on July 10, 1995 by Nana Kojo Esuati IV, a member of the Council of State.

Provision of infrastructure for research, training and education in mathematical sciences can be available to the staff of the Commission and to other Ghanaians.

The functions of the Center are:

1. To advice the Ghana Atomic Energy Commission on policy matters with regard to development and promotion of mathematical sciences as related to the peaceful uses of nuclear energy.

2. To establish strong links with Departments of Mathematics, Physics, Statistics and Computer Science in Ghanaian Universities and other research institutions.

3. To Co-ordinate mathematical research and provide training for undergraduates and postgraduate students (Degrees will be awarded by the Universities of their registration).

4. To host mathematicians (not only Ghanaians) at the Centre for:

a) Seminars;
b) Workshops;

c) Conferences; and
d) Sabbatical and long-term residence.

5. To foster interaction with policy makers on matters relating to mathematics and its promotion and applications.

6. To provide continuing education in mathematics at the pre-tertiary and tertiary level.

The following scientific departments will be created:

a) Department of Theoretical and Applied Mathematics;
b) Department of Computational Mathematics and Computer Science;
c) Department of Pure Mathematics; and
d) Department of Statistics.

The Centre is engaged in the following research areas:

i) Theoretical and Mathematical Physics;
ii) Computational Mathematics;
iii) Mathematical Biology; and
iv) Theoretical Nuclear Physics.

IMPORTANT TELEPHONE NUMBERS

Executive Secretary	-	400303
Deputy Executive Secretary	-	401323
Director, NNRI	-	401272
Director, BNARI	-	402286
Director, RPB	-	400976
Director, NCMS	-	401248
Reactor Manager	-	400398
Manager, DENIC	-	400310 Ext. 207
Manager, RTC	-	402796
Manager, RWMC	-	400310 Ext. 117
Librarian	-	406908 or 400310 Ext. 109
Chief Accountant	-	401354 or 400310 Ext. 102
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GAEC Fax	-	233-21-400807
GAEC E-mail	-	secgaec@ncs.com.gh

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EXECUTIVE COMMITTEE

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Director, RPB	-	Mr. C. Schandorf
Director, BNARI	-	Dr. G. Y. P. Klu
Principal Scientific Officer, NNRI	-	Dr. J. H. Ephraim
Principal Scientific Officer, BNARI	-	Mrs. Victoria Appiah
Chief Accountant	-	Mr. E. V. Asare
Auditor	-	Mr. Awuku Boateng
Administrative Officer	-	Miss Nana Ekua Sangmuah

GAEC Commercial

1) *For all enquires or information concerning yam, plantain, pineapple seedlings, Please contact either*
   The Director, BNARI, GAEC Tel.: 402286 or
   The Head, Plant & Soil Science Tel.: 400310 Ext. 307

2) *For NDT Services, contact The Director, NNRI, GAEC Tel.: 401272 or*
   The Head of NDT, Tel.: 400310 Ext. 212

3) *For authorization to import radioactive materials into Ghana, contact*
   The Director, RPB, GAEC: Tel: 400976 or
   The Head of RPB Laboratories, Tel.: 400310 Ext. 401

4) *DENIC can help you with Computer installation, repairs of PC based instruments of gamma cameras, development of data acquisition and control cards for industry, repairs of laboratory equipment and ultra sound machines. Contact*
   :Manager, DENIC Tel.: 400310 Ext. 207 or 208

5) *For information on Medical sterilization and food preservation contact*
   Manager RTC. Tel.: 402796, 400310 Ext. 213 or
   The Head of Department of Food Science and Radiation Processing ,BNARI. Tel.: 400310 Ext. 310

6) *For information on Tsetse and small ruminant rearing and pest control using sterile insect techniques contact*
   The Head, Department of Animal Science, BNARI, GAEC
   Tel: 400310 Ext. 303

7) *Contact the Director, NNRI to use our Reactor for Research, analyses of samples and tracer studies. Tel.: 401272*

8) *To all Institutions, Industries and private enterprises, if you have any radioactive wastes, spent sealed sources, radium in any form and have accumulated old lighting rods with radium , and smoke detectors with radioactive sources, please contact The Manager, Radioactive Waste Management Centre, GAEC*
   Tel.: 400310 Ext. 117

GAEC welcomes investors from the private sector to participate in our Commercial Ventures!!!

Produced by

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