



**RADIATION PROTECTION INSTITUTE
GHANA ATOMIC ENERGY COMMISSION
P. O. BOX LG 80, LEGON ACCRA.**

PROSPECTUS FOR

**NATIONAL TRAINING COURSE ON RADIATION PROTECTION AND SAFETY FOR
RADIOGRAPHERS AND X-RAY TECHNICIANS, 24 -28 SEPTEMBER, 2018**

1.0. BACKGROUND

Ionizing radiation may be produced naturally or as a result of induced nuclear reaction. Some nuclear reactions occur naturally in substances referred to as Naturally Occurring Radioactive Materials (NORMS) such as Uranium. Most nuclear reactions however, are induced by bombarding the nucleus of an atom with a neutron for instance, in a nuclear reactor. As a result of the bombardment, the atom undergoes disintegration out of which artificial elements, radiant energy and sometimes more neutrons are produced. The artificial element often referred to as radio-isotope, emit radiation of characteristic energy.

X-rays are produced when fast-moving electrons bombard a target atom and remove an electron from an inner shell of the atom. The vacancy created in the inner shell is filled by an electron from an outer shell. The difference in the energy levels of the two shells is emitted as X-rays. This is the basic principle underlying the production of X-rays.

The radiation emitted by radioisotopes as well as X-rays are known as ionizing radiation because they are capable of ionizing atoms when they interact with matter and can cause biological damage.

Nuclear technology focuses on how to utilize ionizing radiation for the welfare of mankind. Ionizing radiation has wide applications in industry, agriculture, medicine, etc.

- In industry, radio-isotopes are used:
 - As tracers for evaluation of chemical processes such as flow rate measurement and mixing efficiency, etc.;
 - For Non-Destructive Testing of welds;
 - For scanning distillation columns, etc.;
 - In nuclear gauges for thickness/leveling gauging, etc.
- In agriculture, radio-isotopes are used:
 - In radiators for food preservation;
 - To study the uptake of nutrients by biological species, etc.
- In medicine, ionizing radiation is used:

- In X-ray machine for diagnosis. Examples of X-ray machines used for medical purpose include *conventional X-ray machine, fluoroscopic X-ray machine, mammographic X-ray equipment, CT scanner, Dental X-ray equipment. etc.*;
- In irradiators for medical sterilization;
- In radiotherapy machine for treatment of cancer.

Notwithstanding the benefits, ionizing radiation can cause biological damage to patients, ionizing radiation workers and the general public if its use is not properly controlled. The damaging effects of ionizing radiation became apparent only a few years after the discovery of ionizing radiation. Researchers, medical physicians using radioactive material and diagnostic X-ray sets began to suffer from burns and other illnesses. In the subsequent 100 years, research has given data on biological effects of high ionizing radiation exposure.

The health effects as a result of undue exposure of patients, staff and the general public to ionizing radiation include:

- Acute radiation syndrome (Hematopoietic, Gastrointestinal, Central Nervous System)
- Skin burns
- Sterility
- Hypothyroidism
- Cataract
- Cancer and hereditary effects.

To ensure that Ghanaians enjoy the full benefits through the safe use of ionizing radiation, the Radiation Protection Institute (RPI) of the Ghana Atomic Energy Commission (GAEC) was subsequently established to undertake research in radiation protection, health physics and other related issues and to provide technical services such as calibration of radiation detection instruments, monitoring of occupationally exposed workers, environmental radiation protection and training on radiation safety and security of radioactive materials. Importantly, the Radiation Protection Institute has over the years organized several training courses, workshops, seminars in the field of ionizing radiation safety to occupationally exposed workers both at the national and international levels. The training courses were organized for Radiographers, X-ray Technicians, Biomedical Engineers, Nurses, Radiation Protection Officers of Mining Companies and Other Paramedics, etc.

This upcoming Training Course is designed to provide Participants whose work result in exposure to ionizing radiation with adequate information and practical experience on safe of ionizing radiation and radiation emitting devices.

1.1. OBJECTIVES OF THE COURSE

This upcoming training programme is aimed at adequately informing the participants of the effects of ionizing radiation and to train and provide them with the necessary skills on the safe use and handling of X-ray machines used in diagnosis.

1.2. SCOPE

The course content include the following:

- ❖ Basic Knowledge of Radiation and Radioactivity
- ❖ Effects of Radiation and Radiation Safety Principles
- ❖ Principles of Ionizing Radiation Protection
- ❖ Occupational Ionizing Radiation Protection
- ❖ Public Ionizing Radiation Protection
- ❖ Design, Layout and Shielding of a Diagnostic Radiology Department
- ❖ X-ray Beam Production
- ❖ Safe Use of X-rays Beam
- ❖ Radiation Protection in Diagnostic and Interventional Radiology
- ❖ Radiation Protection in Radiotherapy and Nuclear Medicine
- ❖ Magnetic Resonance Imaging (MRI) Safety
- ❖ Patient Does Assessment and Image Quality
- ❖ Legislation/Regulation for Control of Ionizing Radiation Exposure
- ❖ Requirements of Nuclear Regulatory Authority, NRA Act 895 of 2015
- ❖ Quality Assurance in Diagnostic Radiology
- ❖ Practical Exercises

Note: This year's course will also focus on:

- *X-ray imaging in Pediatrics and Pregnant women*
- *Proper decommissioning of X-ray machine*
- *Magnetic Resonance Imaging (MRI) Safety*
- *Radiation Protection in Radiotherapy and Nuclear Medicine*

1.3. TARGET GROUP

This Training Course is mainly targeted at radiographers and X-ray Technicians, however Biomedical Engineers, Radiologists, Darkroom Attendants of hospitals and clinics and Nurses may attend.

1.4. NATURE OF COURSE

The training course will consist of lectures, discussions and practical exercises.

1.5. DURATION OF COURSE

This is a five-day training course that starts from September 24-28, 2018

1.6 ALLIED HEALTH PROFESSIONS COUNCIL, GHANA, CONTINUOUS PROFESSIONAL DEVELOPMENT (CPD) CREDIT POINTS

The Course will attract CPD credit points from the Allied Health Professions Council, Ghana.

1.7 VENUE

The training course is proposed to be held at the premises of the Radiation Protection Institute (RPI), Ghana Atomic Energy Commission, located at Kwabenya near Dome in Accra.

1.8 FEES

1. Non-Residential Participants

Participation fee – GH¢ **750.00**

- Includes lunch, snacks, course materials and certificate of participation.

2. Residential Participants

Participants who wish to be residential can be accommodated at the Atomic Guest House, owned by the Ghana Atomic Energy Commission, which is fully air-conditioned with 24-hour electricity supply. (*Please Note: Residential charges are separate from the Participation Fee.*)

Bed and Breakfast @ GH¢ **80.00-120.00** per bed/night

Dinner @ GH¢ **20.00-25.00** per plate

Additionally, there are private Guest Houses/Hotels very close and connected by public transport to GAEC. Their rates range from GH¢ **100.00** to GH¢ **200.00** (Bed and Breakfast).

Contact Persons

For further information and registration, please contact the following:

1. Administrative officer,
Radiation Protection Institute, Ghana Atomic Energy Commission, Kwabenya, Accra Office
(Telephone No. +233-303973790; Email; rpi@gaecgh.org)
2. The Course Director: Dr. J. K. Amoako (Cell: +233-277726656; Email: joe.amoako@gmail.com)
3. The Course Coordinator: Dr. Stephen Inkoom (Cell: +233-244972758; Email: s.inkoom@gaecgh.org)

NB: Office line operates from Monday –Friday @ 8:30 am to 4:00 pm.

1.9 DEADLINES FOR REGISTRATION

1. Deadline for Expression of Interest and Registration 31st August, 2018

**NATIONAL TRAINING COURSE ON RADIATION PROTECTION AND SAFETY FOR
RADIOGRAPHERS AND X-RAY TECHNICIANS, SEPTEMBER 24-28, 2018**

**RADIATION PROTECTION INSTITUTE,
GHANA ATOMIC ENERGY COMMISSION,
KWABENYA, ACCRA**

PARTICIPANT REGISTRATION FORM

Personal information

Prof./Dr./Rev./Mr./Mrs./Ms.:/...../.....
Surname first name middle name

Profession:

Job Title:

Organization/Institution:

Business/Office Address:

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Home Address:

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Contact No:

Office:

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Personal:

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REGISTRATION FEES

Enclosed is my full participation fee.

I hereby enclose my participation fee of an amount of Seven Hundred Ghana Cedis (Gh¢ 700.00)

MODE OF PAYMENT (*tick appropriate one*)

Direct Bank Deposit Cash Cheque

Radiation Protection Institute Account Details:

Account Name: GAEC/RPB Research

Bank: Ghana Commercial Bank Limited

Branch: Legon

Account No. 1031130002373

Signature:

Date:

All completed registration forms and participation fees should be forwarded to

- **Administrative Officer,**
Radiation Protection Institute, Ghana Atomic Energy Commission, Kwabenya, Accra. (Telephone: +233-303973790; Email: rpi@gaecgh.org)
- **Course Director,**
Dr. J. K. Amoako (Cell: +233-277726656; Email: joe.amoako@gmail.com)
- **Course Coordinator,**
Dr. Stephen Inkoom (Cell: +233-244972758; Email: s.inkoom@gaecgh.org)

Deadline for Registration:

Friday, 31st August, 2018

Please Note: Registration is incomplete without the payment of Participation fee.