

NIGERIAN NUCLEAR REGULATORY AUTHORITY

REPORT OF THE 2-WEEKS BASIC TRAINING COURSE ON NUCLEAR SAFETY, RADIATION PROTECTION, AUTHORIZATION AND INSPECTION OF RADIATION SOURCES FOR NEW AND UPCOMING NNRA REGULATORS, ABUJA.

1.0 Introduction

The Management of the Nigerian Nuclear Regulatory Authority (**NNRA**) under the stewardship of the Acting Director General/Chief Executive Officer (DG/CEO) – Dr. Yau Usman Idris approved the organization and conduct of the Two Weeks Basic Training Course (**BTC**) on Nuclear Safety, Radiation Protection, Authorization and Inspection of Radiation Sources for New and Upcoming Regulators. The BTC was to enable new and upcoming regulatory staff that joined the NNRA and have never participated in any standard International Atomic Energy Agency (**IAEA**) Regulators' training have the first time opportunity and refresher opportunity for the few that have attended similar training since joining the NNRA. The BTC was also designed to make regulatory staff competent in authorization and inspection of radiation sources, among other regulatory functions.

Management Staff of the NNRA attended the Opening Ceremonies of each Batch of the BTC. The Acting DG/CEO delivered a Welcome Address in which he encouraged every participant to take the training course very serious in order to pass the examination at the end of the BTC. He also emphasized that the results and performance of each participants will form part of requirements for their next promotion. He declared each Batch of the BTC opened and group photographs were taken.

The Course Director was Mr. Adamu M. Hussaini (Ag. GM-AE) while the Local Organizing Committee was chaired by Mrs. Eyoanwan Bassey (Ag. GM-AF). Over Ninety (90) regulatory officers fall under the trainable category; hence because of the total number of participants in the Headquarters enlisted for this training, the training was split into two (2) and conducted in Batches A and B accordingly:

2. Objectives of the Training Course:

The major objectives of the basic training course for new and upcoming regulators were as follows;

- I. To provide a broad overview of all the concepts in nuclear safety, radiation protection, authorization and inspection of radiation sources.
- II. To equip regulators with in-depth and requisite knowledge needed in carrying out regulatory functions, so as to ensure the protection of life, health, property and the environment from the harmful effects of ionizing radiation in the North West in particular and the country at large.

3. Opening

The training course is to provide the require broad base foundation for all new and upcoming Regulators. This is specially done since the New or Upcoming Regulators come with vast spectrum of Education Qualification and Training. The training Course was declared opened by the representative of the Ag.DG/CEO and the Course Director, Dr. Nasiru Bello

4.0 Participants:

0 Participants

Participants were drawn from all the Technical Departments of the NNRA; comprising the Authorization and Enforcement; Nuclear Safety, Physical Security & Safeguards; Radiological Safety Departments; and the Nuclear Security Centre (**NSC**), as follows:

A. BATCH A

Date : 18th – 29th March 2019

Venue: Newton Park Hotel

1. Ebong Mfon Charles
2. Abiola Sunday Ojuolape
3. Mokidi Bolanle
4. Olaoluwa Philemon Ifeoluwa
5. Olofintuyi Oladotun A
6. Femi Jolayemi
7. Hafeez A. Bello
8. Valentine Okoye
9. Olaide Abiona
10. Abdullahi Hassan
11. Garba Umar Mustapha
12. Olatayo Ikoru-Awa
13. Ndidi Okannah
14. Mohammed Shu'aibu Saba
15. Ezumeh Evaristus Ifeanyi
16. Oguejiofor Onyinyechi
17. Abejide Olugbenga
18. Muhammad Bello Gusau
19. Usman Surajudeen
20. Ndawashi Ahmed Danjuma
21. Auwal Ibrahim Aliyu
22. Imbiakpa Panebi Jessica
23. Dalhatu Faruk Yartsakuwa
24. Ignatius Oche Oduh
25. Ngwakwe Chibuzo
26. Chukwuebuka Kingsley Okpala
27. Comfort Solomon Ladan
28. Okolie Florence Uche
29. Edoviobaghogho Edirin Sandra

30. Okafor Ifunanya Cynthia
31. Omumu Onyeka George
32. Jimoh Lateef Taiye
33. Yusuf Zainab Abdullahi
34. Ayawei Nathaniel A.
35. Abdulrauf Lukman
36. Idongesit Akwaowo Odung
37. Ejembi Julius Amanyi
38. Sandra Nnenna Ogbonna
39. Chinonso Nwagboso
40. Ifemzue Uma
41. Mahmud Dandawaki
42. Osume Okiti
43. Nduka Raluchukwu
44. Bello Rabi

B. BATCH B

Date : 8th – 19th April 2019

Venue: Top Rank Galaxy Hotel

1. Abdurrashid Abdurrahman
2. Zainab Sani
3. Amina Agbab Uthman
4. Babakunle Olainu-Alade
5. Edemanwan Patrick Duke
6. Ashasim Elisha Rimamtanu
7. Adamu Nuhu Abubakar
8. Tosin Abegunde
9. Ikyuu Gabriel A.
10. Edukere Mmandu
11. Zuliat Jummai Aliyu
12. Ehase Usman
13. Tahir Abubakar Tanko
14. Nzekwe Uchechukwu C.
15. Soja Reuben Joseph
16. Omofuma Augustina E.
17. Ezinwanne A. Chukwubuike
18. Uche Thelma Ngozi
19. Kandi Bature H.
20. Kachy I. Adebayo-Oladini
21. Ibe Edidiong Casmir
22. Abraham Adogbo
23. Owunebe George Segun
24. Oluwayemisi Adeniyi

25. Maryann Mbanaso
26. Amofuokhai Andrew
27. Okoro Ikpe Innocent
28. Ekeocha Christabel Ebere
29. Tijani Hassan Gangua
30. Olisekebe Ifeoma
31. Dimari Bashir
32. Ake Oluwatosin Aderinoye
33. Aderogba Qazeem Adelani
34. Odii Christopher Joseph
35. Mukollos Laku Segna
36. Eze Ogechi
37. Olota Mustapha Idowu
38. Abdul-Jalil Batagarawa
39. Akinseye George Kingsley
40. Kaumi Ahmed
41. Arogundade Fanny Umeiye
42. Afolabi Moyo Elizabeth

4.0 Resource Persons and Local Organizing Committee (LOC) Members

a. The **Resource Persons** for the 2 Weeks BTC for both Batches A and B were:

- i. Dr. Yau Idris
- ii. Dr. Nasiru A. Bello
- iii. Dr. Isa Sambo
- iv. Prof. Timothy C. Akpa
- v. Mr. Adamu M. Hussaini
- vi. Mr. Adamu Abdul
- vii. Mrs. Fatima Ige
- viii. Mrs. Moyosola Bello Abubakar
- ix. Barr. John Adamu
- x. Engr. Saiyadi I. Sulaiman
- xi. Mr. Wada Abdullahi A.
- xii. Mr. Effiong E. Ubong
- xiii. Engr. Surajudeen T. Olasinde
- xiv. Mrs. Ethel Ofoegbu
- xv. Mr. Godwin Basse Ekong
- xvi. Engr. Yunusa Muhammad

b. **Local Organizing Committee (LOC) Members**

- i. Mr. Adamu M. Hussaini - Course Director
- ii. Mrs. Eyoanwan Basse - LOC Chairperson
- iii. Godpower Gbeneneh
- iv. Yunusa Muhammad
- v. Dr. Marliyah Mahmoud
- vi. Abdul-Malik Olatunde
- vii. Collins Orji

- viii. Umar Adamu
- ix. Gerald Okeke
- x. Abashe Abdullahi

5.0 Training Programme

The programme of the training Course consisted of Lectures, discussions, examination, evaluation of the training course. The following topics were covered during the technical sessions:

- Radioactivity;
- Interaction of Radiation with matter;
- Radiation Sources;
- Quantities and units;
- Overview of Radiation practices
- Practice specific regulations for medical exposures
- Feedback from inspection of radiology facilities in Nigeria;
- Shielding calculations;
- Occupational radiation protection;
- Biological effects of ionizing radiation;
- Principles of Radiation Protection and the international framework;
- Safety, security of sources, public exposure protection;
- Features of X-ray facility Design;
- Radiation Detectors;
- Radiation protection programme for radiology department;
- Individual Monitoring: External Exposure;
- Patient Dosimetry;
- Transport of Radioactive Materials: transport safety Regulations;
- Transport safety: Packages, Labeling, Placarding, Responsibilities;
- Emergency Preparedness: Emergency response Plan;
- Radiation sources and equipment in radiology: X-ray production, radiographic unit;
- Radiation sources and equipment in radiology: fluoroscopy, interventional radiology, CT scanner;
- Radiation sources and equipment in radiology: Mammography;
- Radiation sources and equipment in radiology: Dental x-ray;

5.1 Training Materials

The participants were provided with soft copies of all the presentations.

5.2 Examination

Examination was administered to each Batch of the training courses by means of multiple choice Questions. Across both Batch A and Batch B participants, the highest score was 59/60 (**98.33%**) while the lowest score was 29/60 (**48.33%**).

6.0 Observations:

The following were some of the significant observations during the Training Course:

- i. Safety culture by regulators and operators is of paramount importance, and should

be given serious attention in all radiation protection practices. Failure to adhere to safety measures prescribed could cause harm to life.

- ii. Safety culture must be promoted in the organization from the top Management to the lowest level and compromise should not be allowed or encouraged.
- iii. Regulatory officers gained broader understanding of, and learnt new and better ways of handling their jobs to achieve better results.
- iv. It was emphasized that enforcement i.e. closing down of facilities that failed to come under regulatory control should be the last option when all other measures are exhausted.
- v. To maintain safety measure; radiation protection worker or regulatory officer should ensure that Thermo-Luminescence Dosimeter (TLD), survey meter and other monitoring devices are calibrated as at when due for optimal performance.
- vi. The participants were acquainted with the new modern technologies were radiation sources are used in different sectors such as agriculture, industries, health, research etc thereby boosting the economy.
- vii. Consequences and lessons learnt in accident and incident that involved use of ionization radiation and nuclear technology. Participants were acquainted with the ways of mitigating accidents in case it occurs.
- viii. Regulators gained more insight on the scope of radiation protection, legal and legislative framework, the essential functions and responsibilities of the regulatory body as well as the responsibility for radiation safety.
 - ix. The participants also acquired more knowledge on methodologies on protection against occupational exposure and various aspects of radiation protection programmes.
 - x. Regulators should ensure strict adherence to safety rules and maintain 'Safety First' slogan as their watch word.

7.0 Recommendations:

The Authority may wish to consider and implement the following arising from the successful conclusion of the BTC for the Regulatory Officers of the Headquarters:

- i. Conduct of this type of Training and refresher trainings should be twice annually to enhance staff competence and performance.
- ii. Inspectors' Industrial Attachment to regulated facilities for all the popular practices and activities should be revived.
- iii. Sponsor at least Ten (10) Regulatory Officers to undertake the Post Graduate Diploma (PGD) or Masters in Radiation Protection (MRP) at the National Institute of Radiation Protection and Research (NIRPR) Ibadan.
- iv. Develop Annual Work Plan for every Department so that every staff will know his activities/schedule of the year.
- v. NNRA Management should domesticate the IAEA Training Model (used for this BTC) to incorporate and reflect NNRA regulatory documents and the Nigerian operationability.
- vi. Develop Inspection Plan annually and implement in compliance with the recommendations of the IAEA-IRRS Mission of 2017.
- vii. Resident Inspectors should be designated and assigned to facilities of critical nature such as Research Reactors, Gamma Irradiation Facility (GIF) and Radiotherapy

Centers to achieve efficiency in regulatory oversight.

- viii. Mentorship programmes should be promoted and encouraged in the NNRA by mandatorily ensuring that experienced and qualified officers directly oversee subordinate ones.
- ix. Engage the Radiographers Council of Nigeria to address the issue of unqualified personnel handling and operating Medical X-ray Machines in Nigeria.
- x. Personnel monitoring of NNRA Regulatory Officers (Inspectors) should be enforced with TLD Badges and other monitoring devices for optimal dosimetry monitoring to ensure staff protection against hazards of radiation sources and equipment generating ionizing radiation.
- xi. Procure additional Survey meters and ensure that they are re-calibrated as at when due.
- xii. Consider and approve for establishment of Enforcement Units in each Zonal Office to strengthen the Authority's/Inspectors' enforcement capabilities towards bring all users of radiation sources in the country.
- xiii. Regular sensitization workshops for operating organizations and other NNRA Stakeholders to create more safety and security awareness; create safety and security culture to ensure that radioactive sources are safely operated and securely managed.
- xiv. Attachment of regulatory officers to the following facilities to gain practical knowledge in the following facilities:
 - a. Center for Energy Research and Training (CERT, Zaria)
 - b. Radiotherapy and Diagnostic facilities at UDUTH, Sokoto; where they have Linear Accelerator
 - c. Radiotherapy Facilities at ABUTH, Zaria, National Hospital Abuja and Diagnostic facility at AKTH, Kano



