

Monitoring and Dose Assessment of Occupational Radiation Protection Exposures –the Nigerian Perspective

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Planned, emergency, and existing exposure situations resulting in occupational exposure, requiring appropriate optimization of protection for doses reduction [1]. Effective monitoring of radiation workers involving use of ionizing radiation by NNRA has improved Radiation Protection in Nigeria [2]. The NNRA assesses external exposures of workers through DSPs from 2012 to 2020, with deployment of dosimeters. The AEDs of radiation workers from practices ranges (0.31-2.48)mSv/yr for 2012, (0.3 –1.44) mSv/yr for 2013, (0.14 –2.34) mSv/yr for 2014, (0.23 –2.42) mSv/yr for 2015 and (0.04 –2.07) mSv/yr for 2016, (0.08-1.64) mSv/yr for 2017, (0.05-2.34) mSv/yr for 2018, (0.38-1.28) mSv/yr for 2019 and (0.06-0.79) mSv/yr for 2020, while average AED ranges between (0.28 to 1.24) mSv/yr from 2012 to 2020 with overall average of 0.81 mSv/yr for 9 years under review, which are all presented in Table 1, Figures 1& 2. The evaluated AED were found below of 20 mSv/yr limits, which by implication shows no radiological hazards to workers in Nigeria [3,4].

Nigeria

Males

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- AED - Annual Effective Doses; NNRA - Nigerian Nuclear Regulatory Authority; DSPs - Dosimetry Service Providers

Table 1: AED of all practices for 2012 to 2020

PRACTICES

/YEAR (mSv) ED 2012 ED 2013 ED 2014 ED 2015 ED 2016 ED 2017 ED 2018 ED 2019 ED 2020

Ind. Rad. 0.57 0.54 0.5 1.1 0.78 1.14 1.61 1.28 0.34

Nuc. Gauge 1.26 0.71 0.25 0.64 1.15 0.63 1.39 0.89 0.79

Well Logging 0.34 0.3 0.14 2.42 0.85 Nil 1.43 0.5 0.19

GIF 0.95 0.86 Nil 1.45 2.07 1.64 1.9 0.38 Nil

Diag. Rad 1.1 0.47 1.64 1.41 0.58 0.6 0.34 Nil 0.17

Radiotherapy 1.22 0.35 0.55 0.92 0.41 0.08 Nil 0.5 0.06

Nuc. Med Nil Nil Nil 1.84 0.04 Nil 2.34 1.17 0.16

Res. Reactor 2.48 1.44 2.34 1.11 1.86 1.33 1.18 1.27 0.79

Activities 0.31 0.4 0.36 0.23 0.15 0.42 0.05 0.47 0.21

Range 0.31-2.48 0.3-1.44 0.14-2.34 0.23-2.42 0.04-2.07 0.08-1.64 0.05-2.34 0.38-1.28 0.06-0.79

Average AED 1.03 0.63 0.64 1.24 0.88 0.65 1.14 0.72 0.30

Figure 1: AED of practices for 2012 to 2020

Figure 2: Comparism of AED for 2012 to 2020

Name of Member State/Organization

Nigeria

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