Q NO : 1

Role of the Radiation protection officer.

A radiation protection officer is a specialist in radiation safety and compliance matters and is an appointed position with in University Health and safety service.

The role of the RPO is to support the university's work with ionising radiations by ensuring arrangements are in place to manage

radiation risks, so that work is carried out safety and in compliance with regulations and so that University employes and the public are protected from harmful effects:

The role involves:

1= Acting as the point of contact with in the university for the external radiation Advises (RPA).

2= Acting as the point of contact with in the university

for regulations relevant to ionising radiations compliance i.e the environment Agency and the Health and safety Executive.

3= preparing periodic status reports on radiation safety and management for purposes of University governance.

4= Managing Environment Agency permits including:

⇒ Making application for new or variation to existing EA permits.

(4)

=) Manage the collation of waste records and make pollution inventory returns to EA on behalf of the University.

=) Advise on the use of Exemptions under the environment permitting regulation 2011.

=) Advise on routes of radioactive waste disposal

5= Monitoring site activity against environment agency permit conditions: including

⇒ Epest inspection and auditing of storage and disposal facilities.

⇒ Auditing holdings and usage records.

⇒ Auditing waste accumulating in stores.

⇒ performing waste sampling when required by the regulator.

6 = Arranging for disposal of radioactive waste to authorised contractors.

7 = Managing facility or site decommissioning.

F = Managing a system for the provision of personal dosimetry and associated record-keeping.

G = Managing an inventory of equipment capable of emitting x-rays.

I = Investigating incidents and report incidents when appropriate to the relevant regulatory authority.

H ⇒ Advising on training in radiation safety.

Q NO: 2:

Radiation protection measure:

1= Minimize Exposure:

⇒ Remember to minimize your exposure at all possible times.

2= Measure your radiation dose Dosimeters.

⇒ Use to measure the occupational dose equivalent from x-ray, gamma, and high energy beta emitters.

⇒ Always practice ALARA (As low as reasonably achievable)

3= Three effective strategies time:

⇒ Minimize the time and you will minimize the dose.

⇒ pre-plan the procedure to minimize exposure time.

4= Three Effective strategies distance:

⇒ Doubling the distance from the source can reduce your exposure intensity by

25 %. (inverse square law).

⇒ Know the radiation intensity where you perform most of your work, and move to lower dose areas during work delays.

5= Three Effective Strategies shielding:

⇒ position shielding btw yourself and the source of radiation at all permissible times- take advantage of permanent shielding.

⇒ Select appropriate shielding material during the planning

stages of the procedure.

6= Room shielding:

=) Lead lined plasted board

=) lead glass viewing window

7= Radiation protection in x-ray

=) lead apons attenuate scattered radiation by 95 %

Recommendations

=) shield thyroid and gonads, always wear lead apons and use dosimeter to

monitor the exposure.

⇒ CT scan should be more justified.

⇒ patient education is important.

⇒ There should be a universal x-ray bank where patient x-ray can be accessible any where, from any hospital.

Q NO: 3:

Radiation hazard:

Radiation can either kill cells or damages the DNA with in them, which damages their ability to reproduce and can eventually lead to cancer. when radiation is present, high energy pasticles pass through your body. These can colide with atoms in your body and disrupt atomic structure.

A hazard is a natural or man-made event which may cause physical damage, economic losses, or threaten human life and well-being if it occurs in agricultural, or industrial activity.

Ionizing radiation is generally considered to be more hazardous to human health than non-ionizing radiation because it can remove electrons from atoms. This means that it can damage living tissue and

DNA. Like alpha radiation, beta radiation is caused by particles.

Radiation hazards may be divided according to:

- External radiation exposure

=) Hazard is related to high penetrating radiation source outside the body.

=) such radiation (eg electromagnetic radiation, high-energy beta and neutron) could penetrate the skin

and body to cause harm to the body.

- **Internal radiation exposure:**

⇒ Hazard is related to radiation source in the body.

⇒ it involves radiation with low penetrating power but usually with high LET that can cause significant internal damage (e.g alpha and beta particles)

Q NO: 4:

Radiation technologist can protect himself from radiation:

X-ray rooms have barriers walls and windows that keep exposure inside the room. During these imaging procedures, radiologic technicians leave the room, or stand behind a protective shield, such as a curtain, that is designed to keep out radiation.

use time, distance and shielding to your self.

putting distance and shielding b/w you and a radiation source is an immediately effective way of reducing your exposure.

Radiation technologist protect ourself from radiation by:

Minimize exposure: when working with radioactive material, remember to minimize your exposure

at all possible time.

Measure your radiation dose dosimeters.

use to measure the occupational dose equivalent from x-ray, gamma, and energy beta emitters. Dosimeters cannot detect radiation from low energy beta emitters

As low as reasonably Achievable

⇒ Always practice ALARA

⇒ As low as reasonably achievable.

Three Effective strategies time

=) Minimize the time and you will minimize the dose.

=) pre-plan the experiment to minimize exposure time.

Three Effective strategies distance

=) Doubling the distance from the source can reduce your exposure intensity by 25 %.

=) use forceps, tongs, and trays to increase your distance from the radiation source.

⇒ Move the item being worked on away from the radiation area if possible.

Three Effective strategies shielding:

⇒ position shielding b/w yourself and the source of radiation at all permissible times. take advantage of permanent shielding.

⇒ select appropraite shielding material during the planning stages of the experiment.

⇒ plexiglas, plywood and lead are effective in shielding radiation exposure. use the

proper shielding for the type of radioactive material present.

Room shielding:

=) Lead lined plaster board.

=) Lead glass viewing window

personal protective Equipment:

=) protective clothing shall be worn when working with radioactive materials. This includes laboratory coats, gloves, and safety glasses.

Occupational dose:

A dose of ionizing radiation received by a person at work, where assigned duties involve exposure to ionizing radiation and radioactive materials.

Annual occupational Dose

whole Body	5000 mrem/year
Lens of the eye	15000 mrem/year
Extremities, skin and individual tissues	50,000 mrem/per year
Minors	500 mrem per year (10%)
Embryo/Fetus	500 mrem per 9 month
General public	100 mrem per year