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VIVA: RADIATION PROTECTION

Date: 13 JULY 2020

Q1 Ans.

**Role of the Radiation Protection Officer in departments:**

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 safely and in compliance with Regulations and so that University employees and the public are protected from harmful effects.

The role involves:

1. Acting as the point of contact within the University for the external Radiation Protection Adviser (RPA).
2. Acting as the point of contact within the University for Regulators relevant to ionizing radiations compliance i.e. the Environment Agency (EA) 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:
  - Make application for new or variation to existing EA Permits.
  - 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 Environmental Permitting Regulations 2011.
  - Advise on routes of radioactive waste disposal.
5. Monitoring site activity against Environment Agency Permit conditions; including
  - Expert inspection and auditing of storage and disposal facilities.
  - Auditing holdings and usage records.
  - Auditing waste accumulation in stores.
  - Performing waste sampling when required by the Regulator.

- Performing measurements to check radiation doses, dose rates and activity.
6. Arranging for disposal of radioactive waste to authorized contractors.
  7. Managing the security of radioactive sources according to current national requirements and carry out periodic security audits.
  8. Managing facility or site decommissioning.
  9. Applying and managing maintenance of a Best Practicable Means (BPM) culture in management and operations including :.
    - Advising on design standards for laboratories and designation of areas.
    - Providing site specific information to the RPA (for BPM, risk assessments etc.).
    - Contributing to the production of local rules and local radiation safety policy.
    - Assessing that BPM is being applied.
    - Advising Radiation Protection Supervisors.
  10. Managing a system for the provision of personal dosimetry and associated record-keeping.
  11. Advising on selection of monitoring equipment and manage a system for the periodic calibration of radiation and contamination monitors and associated record-keeping.
  12. Managing an inventory of equipment capable of emitting x-rays.
  13. Investigating incidents and report incidents when appropriate to the relevant regulatory authority.
  14. Advising on training in radiation safety

Q2:

**PROTECTION FROM RADIATION:**

Radiation is part of our life. Background radiation Help Background radiation that is always in the environment. The majority of background radiation occurs naturally and a small fraction comes from man-made elements., coming primarily from natural minerals, is around us all the time. Fortunately, there are very few situations where an average person is exposed to uncontrolled sources of radiation above background. Nevertheless, it is wise to be prepared and know what to do if such a situation arises.

One of the best ways to be prepared is to understand the radiation protection principles of time, distance and shielding. During a radiological emergency (a large release of radioactive material into the environment), we can use these principles to help protect ourselves and our families.

Q3:

**MEASURE OF RADIATION PROTECTION IN A SAFE RADIOLOGY DEPARTMENT:**

- Implement and oversee the operational aspect of the RPP.
- Ensure that radiation safety activities are being performed in accordance with licensed approved procedures and regulatory requirements.
- Help identify and investigate radiation safety problems.
- Verifying implementation of corrective action.
- Stop operation identified as unsafe.
- Sign semiannual sealed source leak tests and inventories of sealed sources per regulation.

Q4:

**RADIATION HAZARDS:**

Radiation decomposition i.e. splitting of water in H<sup>+</sup> and OH<sup>-</sup> and also splitting of other solvents of the body.

Kinetic energy of the incident photons heats up the molecules of the living tissues.

High energy electromagnetic radiation and particles radiation are capable of producing ions in their passage through matter.

The early effect of radiation is a result of direct injury to the tissues and leads to radiation sickness.

The delayed effect of radiation includes shortening of life span, leukemia, malignant tumor, and cataract.

The biological effects are enhanced by the presence of oxygen which is always present in the cells.