

## TEST ANSWERS: RADIATION

The *BSO Plus Safety Topic* is a review designed from the BSO Plus agenda. This safety topic is your way to stay current on the safety information over the 3 years between BSO Plus and BSR.

### 1. Ionizing radiation can: (Circle all that apply)

- a. Remove electrons from atoms or molecules
- b. Form a charged atom, called an ion
- c. Change the chemical composition of matter
- d. Move or vibrate atoms, but not remove electrons

**RATIONALE:** Ionizing radiation has sufficient energy to remove electrons from atoms or molecules. The damaging effects of ionizing radiation result from this ability to change the chemical composition of matter with which it interacts. Non-ionizing radiation has enough energy to move or vibrate atoms, but not enough to remove electrons.

### 2. Artificial sources of radiation include: (Circle all that apply)

- a. X-ray machines
- b. Nuclear gauges
- c. Minerals in the soil
- d. Radiography instruments

**RATIONALE:** If you work with x-ray equipment, radiography instruments for equipment inspection, or nuclear density gauges, you could be potentially exposed to radiation. Radioactive materials (including uranium, thorium, and radium) also exist naturally in soil and rock.

### 3. "Radiation poisoning" can result in:

- a. Nausea and vomiting
- b. Premature aging
- c. Death
- d. All of the above

**RATIONALE:** People can be exposed to radiation without any sensation or awareness. When the body absorbs radiation, it can cause changes on a cellular level leading to cancer and reproductive abnormalities. Workers may also experience burns or radiation sickness/poisoning. Radiation Poisoning can result in nausea, vomiting, premature aging, and death. Non-ionizing radiation is unlikely to cause cancer. However, if the energy level is high enough, there may be other effects on human health.

4. Radiation from various sources is known to be present in some of the local refineries. These sources include non-destructive testing equipment and crude streams containing Naturally Occurring Radioactive Materials (NORM).

- a. True  
b. False

**RATIONALE:** Low levels of radiation are known to be present in some of the local refineries, including Naturally Occurring Radioactive Materials (NORM).

5. If you will be working in areas with NORMs, you will be required to take additional site-specific training.

- a. True  
b. False

**RATIONALE:** The main ways to control radiation exposure include engineering controls, administrative controls and personal protective equipment. If you are working with or near radiation, you must receive site specific training on how to deal with that hazard.