**ALARA**: “As Low As Reasonably Achievable” Personnel working in the field are required to keep their radiation exposures ALARA.

**Gamma Rays:** High energy, short wavelength electromagnetic radiation emitted during radioactive decay.

**Gamma Radiography:** Radiographs (film, DDA plates, and CR plates) are exposedusing a gamma ray camera or radiograph-shooting machine, which can be portable, fixed in a cabinet or located in a vault.

**Gamma Source (source):** Industrial gamma radiography typically uses a man=made (activated) radiation source (Cobalt-60, Iridium-192, and Cesium-137). These sources are typically created for specific purposes and applications.

**Half-Life:** the amount of time required for ½ of the original number of radioactive atoms to decay or change into daughter atoms.

**Half-Life Ir 192:** 74 days

**Half-Life Co 60:** 5.3 years

**Half-Life Cs 137:** 30.17 years

 **Half- life Calculator**: <https://www.calculator.net/half-life-calculator.html>

**Biological half-life:** the amount of time required for one half of a radioactive substance to be removed (from a human) by the natural biological processes (urination, sweating, bowel movements, vomiting)

**HVL (Half Value Layer):** The amount (thickness) of a given shielding material needed to reduce the radiation emissivity by one-half it’s value.

**HVL Formula:** Io = Original Intensity Id = Desired intensity

$$Log[\frac{Io}{Id}]/Log2$$

**Ionizing Radiation:** a type of radiation that is able to disrupt atoms and molecules on which they pass through, giving rise to ions and free radicals.

**Time, Distance, and Shielding:** These are the three basic tenets of Radiation Safety and the ALARA doctrine.