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Radiation Exposure: What Can I Do?

Experiencing the front line of a crisis is a terrifying experience, especially in the face of uncertainty and fear of the unknown. This point is especially well illustrated in Japan's ongoing nuclear crisis. For over a week now, rescue workers in Japan have dealt with floods, fires, power outages, and infrastructure damage, all compounded with the threat of an escalating nuclear crisis. Radiation levels are at elevated levels for miles around the Fukushima Dai-ichi nuclear complex and scientists are scrambling to determine how much radiation has already been released into the environment. In the interest of providing a little peace of mind to security personnel across the globe whose line of work brings them into contact with critical situations, we have a few basic suggestions on how to avoid radiation risks.

The way the public views radiation has been shaped by some of the most horrific incidents in modern history: Chernobyl and Hiroshima. These extreme cases have influenced many to assume that radiation is an exotic and deadly phenomenon. In reality, our environment is steeped in radiation that our bodies absorb without any proven ill effect. The most important factor in understanding the impact of radiation is quantity – how high radiation levels are and how these levels translate to risk.

Security personnel are key and assist as the first line of defense against these varying dangers of radiation. Organization is extremely important in crisis situations, and even just a few informed individuals can drastically change the outcome of a hazardous situation. Security personnel have to act quickly to mitigate and ascertain the amount of radiation in the environment. Two tools that are absolutely essential to security personnel in a radiation crisis are the dosimeter and radiation detector.

A dosimeter is a small badge worn on the body or a small handheld device used to measure how much radiation the person has been subjected to. Security personnel are often exposed to more radiation in their line of work, and must carefully monitor their dosimeters to tell them when they are approaching risk levels and must leave the danger area. To give some idea of safe radiation levels, natural background radiation – the radiation that we are exposed to every day from cosmic rays and naturally-occurring radioactive materials – is about 620 millirems per year in the United States. A coast-to-coast airplane trip will expose you to about 12 millirems, and a year of watching four hours of television per day adds up to about 2 millirems. These quantities are miniscule compared to a federal occupational limit of exposure at 5000 millirems per year. Children and pregnant women have much lower exposure levels, and very high levels of radiation can cause serious health risks in a short time.

Radiation detectors are indispensable to security efforts because they allow personnel to find contaminated areas and people quickly. A common detector that has been used in the past is a Geiger-Mueller detector, or a Geiger counter. A Geiger counter is a very low cost detector, typically less than $500 USD, and provides very basic detection of large levels of radiation. However, they have significant limitations in a radiation crisis including limited to no detection of lower levels of radiation that can still be dangerous, as well as slower response time. One of the best detection technologies on the market is called a scintillation detector. These detectors, on average, are 100 times more sensitive than Geiger counter and respond more rapidly to radiation, usually within one second, and typically cost around $1,200 USD. The much greater sensitivity of scintillation detectors is important in situations like the Japanese nuclear crisis because the heightened environmental levels of radiation in the ocean near the complex (which are 127 times normal background levels) would not even

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show up on a typical Geiger counter. The information scintillation detectors gather from radiation can even be used to identify different radioactive isotopes. Devices such as the D-tect Systems mini rad-D (a personal handheld detector) and rad-ID (a handheld radiation detector and identifier) and regularly used by security personnel and individuals in such situations to detect and, where necessary, identify the types of radioactive materials a person has been exposed to.

The procedures outlined by government agencies are carefully adapted to each dangerous situation and should be strictly adhered to. These procedures aim to limit the spread of radiation and minimize risk to exposed areas. Although the specific instructions given out for each incident vary, here are a few general guidelines that should always be followed.

First, in case of radiation contamination, get people (including yourself) out of harm's way as quickly as possible and notify authorities. Radiation spreads easily though blowing dust and smoke, so radiation-free secure zones must be established by sealing off areas from the outside environment by closing and weather-proofing doors and windows and placing food and water in well-insulated areas such as basements.

Second, since human skin generally acts a good barrier against low-level radiation, the biggest threat is breathing in radioactive materials or somehow ingesting them. Make sure to wear a face mask in areas that may be contaminated and wash hands regularly. If you suspect someone has been exposed to radioactive dust, the best solution is usually as simple as discarding contaminated clothing and washing with soap and water, as this will rid the body of radiation before it can cause damage. As an additional guard against significant amounts of radiation, potassium iodide tablets are sometimes given to protect to the thyroid gland.

Third, preparation is vital when it comes to any kind of disaster, and we recommend everyone keep an emergency kit close at hand so that they can be personally prepared in case of any crises. This kit should include such things as food and water for a few days, water filtration kit, emergency blanket, rain gear, batteries for radios and detectors, dust mask, extra clothing, flashlight, candles, waterproof matches, cooking utensils, necessary medications, and a first aid kit. Although we generally take these supplies for granted, shortages can occur quickly in crisis situations.

Although the current nuclear crisis is fraught with unanswered questions, appropriate preparation will enable you to minimize potential risks and provide you the ability to safely navigate through any crises, including potential radiation exposure.

D-tect Systems is supplier of advanced radiation and chemical detection equipment sold around the world. www.dtectsystems.com.