

PRECAUTIONARY ADVICE ON RADIATION

There's been a lot of chatter in technical journals recently about a growing awareness of technologically enhanced, naturally occurring radioactive materials from increased oil and gas drilling in the United States. The American National Standards Institute (Washington, D.C.) defines TENORM as "naturally occurring radioactive material disturbed or altered from natural settings or present in a technologically enhanced state due to past or present human activities and practices"

Because the Earth is a giant ball that contains radioactive elements such as uranium and thorium, radioactive materials are everywhere in varying amounts and concentrations. In the United States, the highest concentrations are in Texas and the other Gulf Coast states, while the Western states have the lowest concentrations, according to the June 2014 edition of *Occupational Health & Safety*. Officials estimate that about 30 percent of oil and gas wells produce TENORM.

Scrap companies that recycle metal from drilling operations need to be aware of the risks associated with TENORM and take appropriate precautions. Some of these precautions are universal in nature—that is, they are prudent steps to take with every load—and others are specific to materials from high-hazard sources.

UNIVERSAL PRECAUTIONS

While the vast majority of radioactive sources that enter scrap processing facilities nationwide are TENORM and other naturally occurring radioactive materials, they are far from the only sources. Demolition projects often expose all manner of radioactive sources, from radionuclides used in medical procedures to radioactive gauges and photography devices. The fact is that any incoming load of scrap *could* contain radioactive materials, so it's essential to scan every load coming across your scale for the presence of radiation.

The best solution for this is fixed radiation detection equipment. As a practical matter, handheld survey meters—or Geiger counters—don't work well for primary detection. It's nearly impossible, not to mention impractical and inefficient, to scan the entire length and height of *both* sides of *every* truck using a handheld meter. Handheld survey meters are best used to pinpoint the location of a radioactive source after a fixed system has detected the presence of radiation.

If you detect radiation, you have some decisions to make—most notably, whether to accept the load and isolate the radioactive source or reject the load in its entirety. (In some states, it might be illegal for you to reject the load, so be careful.) If you reject the load, the transporter is responsible for securing a special permit from the U.S. Department of Transportation to return the radioactive load to its place of origin. (Find the application forms for Special Permit 10656 on the ISRI Safety website, www.isrisafety.org, under Best Practices, then Radiation Safety.) One special consideration to keep in mind: If you decide to reject a load that a third-party carrier is hauling, you could face a potential public-relations disaster if the carrier refuses to obtain the DOT special permit and something goes wrong. Word could leak out that you refused to take the load.

If you take possession of the contaminated load, you most likely will have taken possession of the radioactive source as well. At this point, you will need to get state regulators involved. Depending on the state in which you operate, the state might instruct you to hold onto the source and keep it isolated, or it might dispatch a team to take it off your hands. In other instances, you might have to pay a contractor to responsibly dispose of the source for you. You cannot legally dispose of radioactive material on your own.

TENORM-SPECIFIC PRECAUTIONS

According to the U.S. Environmental Protection Agency (Washington, D.C.) and the International Atomic Energy Agency (Vienna), the bad actors in TENORM from oil and gas drilling sites typically are radium and radon gas, the latter of which is a product of the former's decay. Unlike radium, which emits gamma radiation that standard radiation monitoring equipment can detect, radon emits alpha particles that are invisible to standard detection equipment. The primary hazard of alpha-emitters comes from inhaling the electron-sized particles into the deep tissues of the lungs, where they can damage cells and pose a cancer risk.

When workers handle any metal from drilling operations, they should avoid skin contact with potential contamination, wash frequently, and leave dirty work clothes at the job site rather than bringing them home to wash. ■



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