

Manual Section 3	Issue Date 12/01/09	Revision Date 06/15/21	Policy Number LLCP-034
	NORM		

Purpose

The purpose of this document is to brief Company employees on the NORM and its effects on the human body.

Scope

All LLC Companies including, Blanchard Industrial, LLC, GIS Engineering, LLC, Grand Isle Shipyard, Inc., and GWIS, Mack Steel, NuWave, Sun Industries; hereafter identified as “Company”.

Policy

Naturally Occurring Radioactive Materials (NORM) are materials commonly found in our environment, which emit radiation. Contact with NORM is interwoven into our everyday lives. It is found in the structural material of the buildings we work in and in the food we eat. Potassium-40, a radioactive element, is found in our bone structure. NORM is found not only in the oil and gas production industry, but also in the petro-chemical industry, the manufacturing of fertilizer, the mining industry, paper mills, and in some municipal water systems

The primary health hazard posed by NORM is not in external exposure, but in the ingestion of NORM and this can be easily controlled through basic health hygiene practices in the field. NORM can be ingested in any one of three ways:

- Breathing in through the nose and mouth resulting in NORM particulates being taken into the lungs.
- Taken by mouth resulting in NORM particulates being taken into the digestive tract.
- Taken into the bloodstream through open cuts or wounds.

The implementation of basic health hygiene practices covered in this guide when working with and around NORM is designed to reduce any possible health hazards in dealing with NORM and to comply with present state and federal regulations. Any questions concerning NORM or concerns about working around Naturally Occurring Radioactive Materials should be addressed by the program administrator, Corporate HSE Director

Naturally Occurring Radioactive Materials (NORM) in the oil and gas industry occurs in common sedimentary formations such as limestone or shale where naturally occurring radioactive elements, namely uranium and thorium are present. NORM will tend to plate out in production equipment and tubulars in the form of a scale, or precipitate and accumulate with the sludge, which builds up in the bottom of storage tanks and production equipment. Not all scale which forms in production equipment and piping has NORM contamination and the thickness of the NORM scale is not always indicative of the activity levels of the NORM scale found in the pipe or equipment.

The State of Louisiana NORM Regulations specify that equipment and materials exhibiting gamma radiation levels greater than 50 microrem/hour (background cannot be subtracted) at any accessible point shall be considered NORM and shall be handled, treated, and disposed of as NORM. Please note however that equipment whose external readings measured less than 50 microrem/hour may contain deposits whose readings would exceed that level if removed.

Surveys and monitoring to evaluate potential radiological hazards shall be conducted as commensurate with the magnitude of the potential hazard.

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The surveys shall include measurements of radiation levels, concentrations or quantities of radioactive material, and other measurements and evaluations necessary to characterize the potential radiological hazards that could be present.

Radiation detection instrumentation shall be provided as appropriate for performing necessary surveys and monitoring. The instrumentation shall be selected based upon the type of radiation detected, minimum detectable activity measurement capability and range in accordance with the radiological hazards present or anticipated for the project.

Radionuclides are radioactive chemicals that are found in many places. They are usually, but not always, naturally occurring.

What are the different types of radionuclides?

The most common are radon, radium, uranium, gross alpha, and beta and photon emitters.

Radionuclides become a part of the soil in three ways:

- As part of Earth’s original crust (primordial radionuclides)
 - Examples include uranium-235, uranium-238, thorium-232, and potassium-40
- Produced and deposited by cosmic ray interactions (cosmogenic radionuclides)
 - Examples include carbon-14, tritium-3, and beryllium-7; worldwide, cosmic radiation is the primary source of these radionuclides
- Through man-made releases (man-made radionuclides and activities)
 - Examples include the fallout from atmospheric testing of nuclear weapons and radiological events like the Chernobyl accident.

The following precautions for handling NORM scale shall be followed when working with or around NORM contaminated piping, equipment or soil.

- Direct skin contact with radioactive scale and solids will be avoided to the extent possible.
- Eating, drinking, smoking and chewing gum will not be allowed in the work area where work is being performed on contaminated equipment or where contaminated materials are being handled or stored.
- Personnel will thoroughly wash their hands and face after working with contaminated equipment, and before eating, drinking, or smoking, and at the end of the workday.
- The number of personnel in the work area will be kept to a minimum.
- If possible, openings on contaminated equipment will be sealed or wrapped in plastic.
- Maintenance on contaminated equipment will be performed only by companies licensed to do so or by personnel who have been trained in health safety procedures.
- When personnel go in the general area where work is being performed, a NIOSH/MSHA approved dust mask or cartridge type respirator, which has been properly fitted, will be worn.

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- Suitable coveralls, eye protection, and gloves will be worn.
- Activities shall be conducted in well ventilated areas to which access has been restricted.
- Gas processing equipment should be opened, gas freed, and allowed to stand idle for at least 4 hours prior to any entry.
- Equipment contaminated with NORM should be labeled.
- Plastic ground covers will be utilized to the extent possible to contain contaminants and facilitate cleanup.
- Gloves, dust masks, respirators, coveralls, plastic, and rags will be decontaminated or placed in drum, sealed and held for disposal.

Hazard Communication

Employees and contractors shall be appropriately apprised of the presence and hazards of NORM where applicable.

Technologically Enhanced Naturally Occurring Radioactive Material (TENORM)

TENORM is an acronym for Technologically Enhanced Naturally Occurring Radioactive Material.

Rocks and soil contain natural radioactivity, which also dissolves into ground water. The occurrence of these “naturally occurring radioactive materials” (NORM) varies throughout the world, and may be more or less likely given the types of rocks and minerals in a particular area. NORM contributes a part of the natural 'background' exposure from radiation.

When resources are extracted from the earth, the natural radioactive material comes with those resources. In processing the desired resource, the radioactive material is removed and becomes a waste. The radioactive wastes from extraction and processing are called “Technologically Enhanced Naturally Occurring Radioactive Material” (TENORM) because human activity has concentrated the radioactivity or increased the likelihood of exposure by making the radioactive material more accessible to human contact.

The most common naturally radioactive elements are uranium, thorium, and radium. Common sources of TENORM waste are mining and mineral processing, oil and gas production, and drinking water and wastewater treatment. TENORM wastes are not specifically regulated by EPA nor NRC. As a result, the responsibility for regulating TENORM disposal falls to states.

Training

Personnel shall be trained prior to exposure and retraining shall occur when there is reason to believe that any affected employee who has already been trained does not have the understanding and skill required of the training. Circumstances where retraining is required include, but are not limited to, situations where, changes in the workplace render previous training obsolete, changes in the types of PPE to be used render previous training obsolete, and inadequacies in an affected employee’s knowledge or use of assigned PPE indicate that the employee has not retained the requisite understanding or skill.

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Training shall include:

- Fundamentals of Radiation Safety.
- Characteristics of Radiation.
- Units of Radiation dose and quantity of radioactivity.
- Levels of radiation from sources of radiation.
- Methods of minimizing radiation dose.
 - Working time
 - Working distance
 - Shielding
 - Respiratory precautions
 - Use of anti-contamination clothing.

Radiation Detection/Instrumentation to be used.

- Use of radiation survey instruments.
 - Operation
 - Calibration
 - Limitations
- Survey techniques
 - Use of personnel protective equipment
 - The Requirements of Pertinent State Regulations.

Please note that personnel may encounter NORM when removing piping or equipment that is contaminated with NORM. Personnel performing such operations shall be adequately trained.