

1.1 PURPOSE

- 1.1.1 The purpose of this policy is to identify the presence of NORM in operations and to control the exposure to TERRY R PITT CONSTRUCTION personnel as well as the environment. TERRY R PITT CONSTRUCTION will control potential exposure to NORM through identification, employee training, and safe handling procedures. Equipment and facilities with elevated radioactivity will be identified prior to performing any work with TERRY R PITT CONSTRUCTION personnel in NORM environments. Site identification, safe practice provisions, storage, and handling guidelines detailed in the remainder of this section apply to all facilities where an elevated level of radioactivity has been exhibited. The waste, property, and equipment disposition provisions are applicable where a radioactive level in excess of governmental mandated ceilings or acceptable industry standards has been detected.

1.2 RESPONSIBILITIES

- 1.2.1 TERRY R PITT CONSTRUCTION operations manager (Program Administrator)

1.2.1.1 Ensure adherence to TERRY R PITT CONSTRUCTION's NORM procedure

1.2.1.2 Provide training covering PPE requirements, safety precautions, and handling procedures to employees working with potential NORM tainted equipment, material, sands, and/or solids.

1.2.1.3 Ensure employees performing equipment repair are advised of potential presence of NORM and that PPE requirements, safety precautions, and handling procedures are being followed.

1.2.1.4 Ensure proper packaging, shipping papers, labels, and placards are provided prior to transport of NORM containing equipment, materials, sands and/or soils.

1.2.1.5 Ensure that a survey of tubing, equipment, materials, sands, and/or soils is performed to determine the presence of NORM prior to releasing for repair or disposal.

- 1.2.2 Supervisors and employees involved in work where radiation exposures may be present share in the responsibility for maintaining a safety margin by use of site-specific and task-specific safe work procedures based on hazard analysis and safety planning prior to the commencing of work.

1.3 BASIC RADIATION EXPOSURE SOURCES

- 1.3.1 External (penetration through the skin) Gamma radiation exposure

1.3.1.1 Contaminated equipment

1.3.1.2 Contaminated soil

1.3.2 Internal (Alpha, Beta, and Gamma) radiation exposure

1.3.2.1 Inhalation of Radon or NORM particles

1.3.2.2 Ingestion of NORM radionuclides

1.4 Enhanced levels of NORM radionuclides may be associated with certain natural materials, minerals, and other resources. Exploitation of these resources may lead to further enhancement of the radioactivity in the products, byproduct, residues, or waste arising from the industrial process. A potential outcome is an increase in occupational exposure to radiation.

1.4.1 Locations of possible exposures:

1.4.1.1 Mining and mineral processing, including mineral sand, alumina, tantalum, tin smelting, and copper production

1.4.1.2 Downstream processing of heavy minerals, including titanium and zirconium (a refractory material in the steel industry, in abrasive materials)

1.4.1.3 Fossil fuel use

1.4.1.4 Metal smelting process

1.4.1.5 Ceramics and building materials

1.4.1.6 Abrasive blasting operations

1.4.1.7 Water treatment and purification

1.5 BASIC NORM EXPOSURE PRECAUTIONS

1.5.1 The purpose of this guideline is to minimize employee exposure to the low levels of radioactivity in the equipment where NORM does exist.

1.5.2 The following guidelines are applicable to all activities associated with exposure or potential exposure to NORM and should be followed at all times.

1.5.3 Advise employees and contractors of the presence of NORM and any precautionary guidelines to be followed.

1.5.4 Direct skin contact with NORM containing scale and solids will be avoided to the maximum extent reasonably possible.

1.5.5 Eating, drinking, smoking, and chewing will not be allowed in the immediate area where work is being performed on contaminated equipment or contaminated soils are being handled.



- 1.5.6 Personnel will thoroughly wash their hands and face after working on or around contaminated equipment and prior to eating, drinking, smoking, or chewing.
- 1.5.7 Protective gloves, clothing, apparatus, rags, etc., should be decontaminated after use. If decontamination is not possible, those articles should be placed in properly labeled drums for subsequent disposal.
- 1.5.8 Personnel will be monitored following completion of work.
- 1.5.9 NORM containing scale and solids will be handled in the wet state to minimize airborne particles.
- 1.5.10 The number of personnel in the work area will be kept to an absolute minimum.
- 1.5.11 Activities that could potentially create airborne NORM particles such as grinding, drilling, polishing, welding, or brazing will require the use of a NIOSH approved high efficiency particulate respirator suitable for low-level radionuclides.
- 1.5.12 Suitable disposable coveralls, slicker suits, etc., will be worn.
- 1.5.13 Impervious gloves and rubber boots will be worn.
- 1.5.14 Work will be conducted in well-ventilated areas. If natural ventilation is not sufficient, forced ventilation will be installed to remove gases and airborne particulates.
- 1.5.15 Plastic ground covers will be used whenever possible to contain contaminants which may fall to the ground.
- 1.5.16 Additional radiation monitoring will be conducted during the time when work on contaminated equipment is being performed.

1.6 MONITORING

- 1.6.1 A competent person designated by TERRY R PITT CONSTRUCTION will perform NORM surveys for all suspected NORM contaminated materials. Monitoring guidelines will be as follows:
 - 1.6.1.1 Maximum allowable dose rate to an individual is 1250 mR/calendar quarter. Approximately 2.4 mR/hour for an 8-hour shift in a 40-hour week.
 - 1.6.1.2 Exposure monitoring is required for a dose exceeding 350 mR/calendar quarter. Approximately 0.6 mR/hour for an 8-hour shift.
 - 1.6.1.3 OSHA regulates exposures to airborne radioactive material by reference to the Nuclear Regulatory Commission regulations.
- 1.6.2 Radiation detection instrumentation will be provided as appropriate for performing necessary surveys and monitoring. The instrumentation will 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 job.

- 1.6.3 Detection and monitoring will be done only by trained and qualified personnel who are familiar with the type(s) of equipment in use and methods to be followed as determined by the site-specific radiation protection program.

1.7 CONTROLLING AND MINIMIZING EXPOSURE

- 1.7.1 Measure all sources and levels of radiation.
- 1.7.2 Minimize time spent in radiation areas.
- 1.7.3 Maximize the distance between you and the source.
- 1.7.4 Shields are to be used to block and reduce radiation levels.

1.8 TRAINING

- 1.8.1 All employees engaged in work assignments where the potential for NORM accumulation exists will be trained to an awareness level on the subject of NORM. Training will be done prior to exposure and annually thereafter.
 - 1.8.1.1 Recognition of potential NORM containing equipment and material.
 - 1.8.1.2 Health effects associated with exposure to low-level radiation.
 - 1.8.1.3 Methods by which NORM may enter the body.
 - 1.8.1.4 Safety precautions and personal protective equipment.
 - 1.8.1.5 Handling procedures for dismantling equipment, vessel and tank entry, scale removal, equipment repair, pulling and rattling tubing, etc.
 - 1.8.1.6 Normal and emergency operational procedures.
- 1.8.2 Records of persons receiving awareness level training will be documented and maintained in the training database.