



M&A Safety Services

512 Viaulet Road
Youngsville, Louisiana 70592
Main: 337-451-4685
Fax: 337-451-5847
www.masafetyservices.com

NORM Worker

Course Outline

Prerequisites: This course shall have no formal pre-requisite.

Course Length: 6-8 hours – Course length shall vary depending on the number of delegates.
Total course time includes breaks.

Class Size: The maximum number of delegates that may be trained and tested per instructor shall be thirty-five (35) in the classroom session

Course Objective

-) Provide delegates assigned to work with or around NORM the necessary skills to safely perform their jobs.
-) Provide delegates with recommended practices and guidelines to perform safely while working with NORM.
-) Delegates should be able to demonstrate knowledge during a written examination.

Course Design

-) Power Point© / Lecture / Audio Video / Visual Aids

Successful Course Completion

-) Requires a minimum score of 75% or better.
-) Grades shall be calculated by dividing the number of questions answered correctly by the total number of exam questions.
-) Delegates will have no more than thirty (30) minutes to complete the exam.

Course Content Summary

-) Classroom

Breaks: 10 minutes (approximately every hour)

Lunch: 1 Hour

Course Outline

About NORM

-) What is NORM?
-) Review Regulations

About Radioactivity

-) Natural Sources of NORM



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-) Understanding Radioactivity
-) Understanding Atoms

Radiation

-) What is radiation?
-) Types of Ionizing Radiation
 - o Alpha Particles
 - o Beta Particles
 - o Gamma Radiation
-) Penetrating Power of Different Ionizing Radiation
-) Periodic Table Groups
 - o Review Periodic Table of Elements
 - o Ionizing of Matter
-) Sources of Radiation
 - o Natural
 - Discuss examples
 - o Artificial
 - Discuss examples

NORM in the Workplace

-) Oil & Gas Industry
-) NORM within Oil & Gas Production Facilities
 - o How Radium Flows
-) The Accumulation of Radioactive Materials
-) Radon Gas
 - o How Radon Gas Flows
-) Technologically Enhanced NORM (TENORM)

Radiation & Contamination

-) Modifying Units of Measure
 - o Milli
 - o Micro
 - o Nano
 - o Pico
-) Measurement Terms for NORM Detection
 - o Roentgen
 - o Roentgen Equivalent Man (REM)
 - o Roentgen Absorbed Dose (RAD)
 - o Curie
 - o Mico-Roentgen Per Hour
 - o Counts Per Minute (CPM)



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-) Radioactive Contamination
 - o Loose Contamination
 - o Fixed Contamination

Hazards of Contamination

-) Large Dose of Radiation (Acute)
 - o General Effects of Body
 - o Legal Limits
 - o General Radiation Exposure Effects
 - 0-50 REM
 - 80-120 REM
 - 130-170 REM
 - 180-122 REM
 - 270-330 REM
 - 5,000 REM
-) Contamination Theories
 - o Linear Dose Effect Theory
 - o Threshold Dose Effect Theory
-) Health Effects of NORM Exposure
-) Internal Contamination Effects
-) Common Methods of Exposure
-) Other Radiation Risks

Worker Protection

-) Review Safe Work Practices

Signs & Labels

-) Postings in NORM Areas
 - o Restricted Areas
 - o Radiation Areas
 - o Stored Material Areas
 - o Airborne Radiation Areas
 - o High Radiation Areas
-) NORM Container Markings
-) "Notice to Employees" Document

NORM Detection

-) Reliable Detection & Measurement of NORM
 - o NORM Meters
 - Probe Attachment
 - Pancake Attachment



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- Optically Stimulated Luminescence Dosimeters
-) Establishing Safe Work Boundaries
-) NORM Radiation Surveys
-) Record Keeping
-) Recommended NORM Site Documents

Personal Protective Equipment

-) Discuss Common PPE
 - Gloves
 - Respirators
 - Safety Glasses/Face Shields
 - Coveralls/Disposable Clothing
 - Rubber Boots
 - Hard Hats
-) Discuss Techniques:
 - Proper Fit
 - Condition
 - Nature of Work
 - Donning PPE
 - Removing PPE (Potentially Contaminated)

Decontamination

-) Decontamination Procedures
-) Decontamination Concepts

Emergency Response Procedures

-) NORM Spill Emergency
-) Injured Worker
-) Fires & Explosions

Practical Session

-) None

Training Center Provided Material

-) Course Materials
-) NORM Meter

Delegate Requirements

-) None



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Reference Material / Documents

Department of Transportation (DOT)

- 49 CFR 173 – General Shipping Requirements

Department of Environmental Quality (DEQ)

Implementation Manual for Management of NORM in Louisiana

Radiation Protection Division