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Course Syllabus **Transport of radioactive Materials**

Initial: 24 hours
Recurrent: 16 hours

Introduction

Title 49, Code of Federal Regulations, Subchapter C is discussed in detail, including the advent of the regulations, the governmental agencies that are responsible for the development and enforcement of these regulations, the use of the 49 CFR within the United States, including the specific requirements for radioactive materials.

Classification

A quick review of the nine internationally recognized hazardous materials classes are evaluated including the accident history, physical and chemical properties of each and the subdivision of the first six hazard classes. Examples of relevant products are given for each. Marine pollutants, hazardous substances, hazardous wastes, mixtures and solutions, not otherwise specified (N.O.S.) categories are defined and evaluated. Limited quantities and consumer commodities are also discussed in some detail, including the economic advantages of packaging subdivision.

Principles of Radiation

The principles of radiation are discussed including natural radiation sources, ionizing and non-ionizing radiation. In addition, radiation control and exposure are detailed. Practical exercises using radioactive detection devices are offered.

Hazard Communication

The domestic and international marking, labeling and placarding requirements are compared and contrasted. Inner packagings, packages, overpacks and cargo transport unit marking, labeling and placarding issues are discussed. Relevant examples of each are offered and discussed in class. Limited quantity, low specific activity, empty packagings, and excepted articles are discussed in detail.

Packing and Packaging

Packaging selection and design are discussed, including the use of United Nations Performance Oriented Packagings and U.S. DOT Specification packagings. Non-bulk, bulk and intermediate bulk packagings are compared and contrasted. Current packaging marking, manufacturing and testing methods and principles are discussed.

Type A and Type B packaging, including RAM Cask Testing is discussed in detail. Students will identify appropriate packaging types, marking and labeling based on radionuclides, activities, form and other requirements.

Documentation

Documentation, including Bills of Lading, Waybills, Dock Receipts, Certificates and Declarations are highlighted in this session. Modal and country specific requirements for the transport of radioactive materials, including excepted articles, low specific activity substances, instruments and articles and other radioactive materials are discussed in detail. The 49 CFR, IMDG Code, IATA, ICAO, IAEA and other requirements are compared and contrasted. Relevant examples are used to illustrate the effectiveness of the tips and tools that are offered.

Segregation

Compatibility of hazardous materials is discussed. Students will be able to determine the appropriate segregation distances for hazardous goods within trailers and containers using the segregation schedules that are offered in class. Segregation between hazardous and non-hazardous goods is also discussed.

Emergency Response Procedures

Students will learn how to reduce the risk associated with the carriage of dangerous goods, including preventative measures, risk analyses, performing quality control checks and pre trip inspections. Students will learn what types of information and equipment is required for a successful mitigation and the appropriate costs for a hazardous materials clean-up operation.

Certification & Other Topics

The course will also address any relevant issue(s) brought up by the participants and will include detailed relevant discussions. Certificates of Completion are awarded to participants achieving an 80% or better on the examination. Certificates of Attendance are given to participants who do not achieve an 80% or better and an opportunity to take the course/exam again at no cost is given.

TRANSPORT OF RADIOACTIVE MATERIALS

