ATTACHMENT F2

TRAINING COURSE AND QUALIFICATION CARD OUTLINES

(This page intentionally blank)

ATTACHMENT F2

TRAINING COURSE AND QUALIFICATION CARD OUTLINES

TABLE OF CONTENTS

Course Outlines 1
GET-19X/GET-20X/GET-21X - General Employee Training 3
GET-19XA/GET-20XA/GET-21XA - General Employee Training Refresher 7
HWW-101 - Hazardous Waste Worker 9
HWW-102 - Hazardous Waste Worker Refresher 12
HWR-101 - Hazardous Waste Responder 15
HWR-101A - Hazardous Waste Responder, Refresher 19
HWS-101 - Hazardous Waste Worker Supervisor 20
HWS-101A - Hazardous Waste Worker Supervisor-Refresher 22
SAF-630/631 - Respiratory Protection 23
SAF-515 - Confined Space 26
SAF-515A - Confined Space 27
RAD-101 - Radiological Worker I 28
RAD-201 - Radiological Worker II 35
TRG-293/298 - Subject Matter Expert and On-the-Job Training 37
TRG-300 - Classroom Instructor - Level II 39
MED-101 - First Aid and CPR 50
MED-101A - First Aid and CPR Refresher 52
HMT-102 - Hazardous Materials and Waste Transportation 53
HMT-104 - DOT Emergency Response Information 61
SAF-501 - Inexperienced Miner Training 62
SAF-502 - Mine Safety-Experienced Miner Refresher 69
RIG-001 - Incidental Rigger 72
OPS-115 - Conduct of Shift Operations 74
TRG-296 - Root Cause Analysis 78
SAF-645 - RCRA Emergency Coordinator (WIPP Contingency Plan Procedure) 80
SAF-632 - Office Warden 82
SAF-621 - Firefighter I 83
EOC-101 - Initial Mine Rescue 90
Radiological Control Technician Fundamental Academic Lessons 92
Radiological Control Technician Site-Specific Academic Lessons 98
Radiography (Level 1) 105
Radiography (Level 2) 106
Visual Examination (Level 1) 108
Visual Examination (Level 2) 110

Qualification Cards 113
CH Waste Handling Technician (WH-01A, WH-01B) 115
CH Waste Handling Engineer (WH-02) 115
RH Waste Handling Technician (RH-01A, RH-01B, RH-01C) 117
RH Waste Handling Engineer (RH-02) 117
Radiological Control Technician (RCT) 119
EST-01 Emergency Services Technician 120

FPT-01 Fire Protection Technician 122
Quality Assurance Inspector 124
Facility Operations Roving Watch 126
Central Monitoring Room Operator 128
Facility Operations Shift Supervisor 130
WWIS Data Administrator 132
Radioactive Transportation (TE-01) 134
Federal Motor Carrier Safety Regulations (TE-02) 134
Hazardous Materials (TE-03) 134
Hazardous Waste Shipments by Public Highway (TE-05) 134
Sampling Team (ST-01) 135
Sampling Team Assistant (STA-01) 136
Waste Handling Hoist Equipment Operator 137
Waste Handling Shaft Tender Operator 138

Course Outlines

(This page intentionally blank)

1

COURSE: GET-19X/GET-20X/GET-21X - General Employee Training

DURATION: ≈ 16 Hours

PREREQUISITES: None

SCOPE:

TYPE: Classroom

OBJECTIVES: Upon completion of this course, the student will be able to perform their job in a safe manner and will have an overview of the site organization and description.

Mastery of the terminal objectives will be demonstrated by scoring 80 percent or higher on the course examination.

REFRESHER: GET-19XA/GET-20XA/GET-21XA annually

COURSE DESCRIPTION (by module)

1. Site Overview & WIPP Description
   ≈1 hour
   a. Mission of DOE and CBFO
   b. Relationship of WIPP organizations
   c. Surface structures
   d. WIPP shafts
   e. Underground area

2. Emergency Preparedness (includes Occurrence Reporting)
   ≈1 hour
   a. Definition of occurrence
   b. DOE Order 5000.3B
   c. WP 12-ES3918
   d. Occurrence reporting process
   e. Employee involvement with Emergency Preparedness
   f. Types of emergencies
   g. Emergency response by WIPP groups
   h. Off-site response groups
   i. WIPP emergency procedures
   j. Emergency equipment
   k. Employee actions during emergencies

3. General Safety
   ≈1 hour
   a. Personal Protective Equipment
   b. Requirements for PPE
   c. Warning Tags
   d. WIPP safety hazards
   e. Medical assistance
   f. Actions to take for injuries
   g. Reporting injuries/accidents
   h. Employee concerns

4. Computer Security
   ≈1 hour
   a. Department to contact
   b. WIPP policies and procedures for:
      1. Personally owned software
      2. Computer games
      3. Passwords/password protection
   c. Computer virus prevention

5. Fire Protection
   ≈1 hour
   a. WIPP Fire Protection Program
   b. Fire sources at WIPP
   c. Fire Tetrahedron
   d. Classes of fires
   e. Fire extinguisher
   f. Office Warden Program
   g. Employee responsibilities during a fire

6. RCRA & Storm Water Management
   ≈2 hours
   a. RCRA history
   b. RCRA goals
   c. WIPP goals and relation to RCRA
   d. Definition of RCRA wastes
   e. Site generated waste program
   f. Training requirements for treatment storage and disposal facilities
   g. Contingency Plan
   h. Waste Minimization Program
   i. RCRA regulatory agencies
   j. RCRA enforcement options
   k. Application of Storm Water Management policy in relation to the general employee

8. Work Policies and Procedures
   ≈1 hour
   a. DOE Orders and MOC Procedures
   b. Teamwork
   c. Conduct of Operations Policy
      1. Elements of Conduct of Ops
   d. Quality Assurance Program
   e. Responsibility for following procedures
   f. Resuming work after stoppage
   g. Stopping work for unsafe acts
   h. Purpose and uses of “Hold Tag”
   i. Quality records and requirements
   j. Correcting errors on QA Records
   k. Configuration Management and affected departments

9. Electrical Safety
   ≈1 hour
   a. Variables of electrical circuits
   b. Severity of electrical shock
   c. Areas where electrical accidents occur
   d. WIPP policy on using damaged electrical equipment
   e. WIPP policy for modifying electrical protective devices
   f. Requirements for use of Ground Fault Interrupters.
   g. Purpose of GFIs
   h. WIPP policy for resetting breakers
   i. WIPP policy for using extension cords, plug-in devices, and other equipment exposed to energized electrical circuits

10. Hazard Communications
    ≈1 hour
    a. Description of Haz Comm Std.
    b. Health and Safety hazards
    c. Protection from workplace hazards
       1. PPE
       2. Preparedness/Prevention
       3. Employee responsibilities
    d. Emergency procedures
    e. WIPP Hazard Communication Prog.
       1. Training
       2. Container labels
       3. Chemical transfers
       4. Material Safety Data Sheets
    f. Other information sources

11. Personal Protective Equipment
    ≈1 hour
    a. Requirements for head protection
    b. Requirements for hearing conservation
    c. Requirements for face/eye protection
    d. Requirements for foot protection

12. Bloodborne Pathogens
    ≈1 hour
    a. Def. of Bloodborne Pathogens
    b. Def. of Hepatitis B and Human Immunodeficiency Virus
    c. Bloodborne Pathogen transmission
    d. Prevention of bloodborne pathogen infection
    e. WIPP Exposure Control Plan

13. Ergonomics
    ≈2 hours
    a. Cumulative Trauma Disorder
    b. Risk factors for CTD
    c. Prevention of CTD
    d. Recognition of CTD
    e. Steps to take when CTD develops

14. Security
    ≈1 hour
    a. Security Mission
    b. Def. of Security Officer
    c. Security Officer Tasks
    d. Access and Property Control at WIPP
    e. Badge accountability
    f. Property Pass system
    g. Physical security
    h. Telephone threat list
    i. Employee responsibilities during demonstration
    j. Fitness for duty
    k. Computer security
    l. Parking requirements

15. General Employee Radiological Training (GERT)
    ≈1 hour

    This program will be implemented prior to declaration of site readiness for all site employees. The standardized core materials for GERT include the following topics:

    Sources of Radiation
    Non-ionizing and Ionizing Radiation
    Risk in Perspective
    ALARA Concept
    Radiological Controls
    Monitoring/Dosimetry
    Emergency Procedures
    Employee Responsibilities

All times are approximate and do not reflect time spent on additional topics that arise from class participation, student breaks, class size, and/or practical exercises. (i.e., Job Performance Measures)

1

COURSE: GET-19XA/GET-20XA/GET-21XA - General Employee Training Refresher

DURATION: Self-paced Course

PREREQUISITES: None

SCOPE:

TYPE: Self-paced Module

OBJECTIVES: Objectives are stated at the beginning of each module, including security, radiological basics, general safety, hazard communications, bloodborne pathogens, hearing protection, and OSHA/RCRA.

Mastery of the terminal objective will be demonstrated by scoring 80 percent or higher on the module examination.

REFRESHER: Annually

COURSE DESCRIPTION (by module)

1. Introduction
   a. Self Paced Course
   b. Information about WIPP organizations
   c. Appendix Information
      1. Storm Water Management
      2. WIPP Land Withdrawal Act
      3. DOE Mission
   d. Exam Guidelines

2. General Security
   a. Prohibited Articles
   b. Primary responding agencies
   c. Wearing your badge
   d. Escort Responsibility
   e. Number of visitors an employee may escort
   f. When to turn off your computer
   g. Personal Property Passes

3. Computer Security
   a. Point of contact
   b. WIPP policies and procedures for:
      1. Personally owned software
      2. Computer games
      3. Passwords/password protection
   c. Computer virus prevention

4. Fitness for Duty
   a. Reasons for the Fitness for Duty Program
   b. General Employee Responsibilities

5. RCRA	a. Types of waste disposed b. Waste Identification
6. Storm Water Management	a. Application of Storm Water Management policy in relation to the general employee
7. Bloodborne Pathogens	a. Transmission Identification of Bloodborne Pathogens b. Prevention of Hepatitis B and Human Immunodeficiency Virus c. Actions to take if exposed
8. Hazard Communications	a. Purpose of MSDS b. Responsibilities when transferring hazardous materials c. WIPP Hazard Communication Prog. 1. Training 2. Container labels 3. Chemical transfers 4. Material Safety Data Sheets
9. Ergonomics	a. Identification of CTD b. Ways to prevent CTD c. Required actions
10. Personal Protective Equipment	a. Requirements for head protection b. Requirements for hearing conservation c. Requirements for face/eye protection d. Requirements for foot protection
11. General Safety	a. Requirements for obeying signs and tags b. Requirements for reporting an occurrence c. Actions for emergency situations d. Resolving employee concerns e. Proper uses of extension cords f. WIPP Circuit Breaker Policy g. Steps to take when responding to fire h. Responsibilities when fighting a fire i. When to use the sign-out board
12. Conduct of Operations	a. Goals of In-House Management Program b. Required actions before posting information c. Correcting a written record d. Point of Contact for Records Management

1

COURSE: HWW-101 - Hazardous Waste Worker

DURATION: ≈24 hours

PREREQUISITES: None

SCOPE:

REFRESHER: HWW-102 Annually

COURSE DESCRIPTION (by module)

1. Course and Regulatory Overview
   ≈1 hour
   a. OSHA regulations and their applicability to RCRA facilities and operations
   b. RCRA standards for generator facilities and for TSDFs
   c. DOT/EPA regulations and applicability to hazardous waste transportation

2. Hazard Communications
   ≈1 hour
   a. Purpose of the Hazard Communication standard (29 CFR 1910.1200)
   b. Locations of Material Safety Data Sheets (MSDS)
   c. Labeling of containers
   d. Other resources for information on hazardous materials/waste including NFPA 704 hazard warning symbol, DOT United Nations Identification System, DOT Emergency Response Guidebook, NIOSH Pocket Guide to Chemical Hazards. Student exercises are included in this section on the use of these references.

3. Principles of Toxicology
   ≈3 hours
   a. Dose-response relationship with regard to exposures to hazardous materials
   b. Immediate and delayed effects (acute and chronic effects)
   c. Different ways substances enter the human body
   d. Effects of substances on the human body including target organ effects, systemic effects, carcinogens, and genetic effects

	e. Exposure limits including Threshold Limit Value (TLV), Permissible Exposure Limit (PEL), Lethal Dose 50% (LD_{50}), Lethal Concentration 50%(LC_{50}) f. Effects of temperature extremes on the human body including signs and symptom heat stress and cold stress g. Effects of ionizing radiation
4. Hazards ≈3 hours	a. Safety and health hazards when conducting hazardous waste operations including fire, explosion, oxygen deficiency, ionizing radiation, biological, electrical, heat and cold stress b. Hazard classification including chemical, physical, mechanical, biological, and radiological c. Airborne hazards including gases, vapors, and particulates d. Properties of materials including corrosivity, pH, flammability, explosivity, (upper and lower explosive limits), specific gravity, vapor density, boiling point, solubility, and reactivity e. Protection from hazards f. Confined space hazards g. Causes and prevention of accidents
5. Personal Protective Equipment ≈3 hours	a. Description and examples of Personal Protective Equipment (PPE) b. Factors in the selection of PPE c. Non-radiological and radiological hazards d. Selection process for PPE e. Ways substances enter PPE including permeation, degradation, penetration f. Equipment included in each of the four levels of PPE adopted by the EPA (Levels A, B, C, and D), capabilities and limitations of each level g. PPE inspection h. Job scope planning i. Human factors that limit the use of PPE j. Demonstration on donning and removal of Level D PPE. Students perform a Level D dress out sequence and are evaluated by a Job Performance Measure.

6. Satellite Accumulation Areas ≈2 hours	a. Purpose of hazardous waste satellite accumulation areas (proper accumulation of hazardous waste to protect human health and the environment) b. Key elements of satellite accumulation areas including maintenance of containers, labeling, maximum quantities allowed, and transfers to storage area c. Inspection criteria including aisle space, stacking of containers, closing of containers, labeling requirements, containment structures, housekeeping, warning signs, alarms, fire extinguisher, spill control materials, and ignition sources
7. Decontamination ≈2 hours	a. Purpose of decontamination (prevent the spreading of contamination, prevention of exposure to workers, protection of the environment) b. Causes and prevention of worker contamination c. Decontamination planning including methods for decontaminating d. Layout of decontamination stations e. Emergency decontamination procedures

All times are approximate and do not reflect time spent on additional topics that arise due to class participation, student breaks, class size, and/or practical exercises. (i.e., Job Performance Measures)

1

COURSE: HWW-102 - Hazardous Waste Worker Refresher

DURATION: 8 hours

PREREQUISITES: HWW-101

SCOPE: This course reviews precautions for safe handling and use of a hazardous material and the management of any hazardous waste generated during these activities. This is accomplished by reviewing the concepts presented in HWW-101 and the application to a particular hazardous material by the use of a Material Safety Data Sheet (MSDS). Also included in this course is an overview of mixed waste.

TYPE: Classroom and Practical

COURSE DESCRIPTION (by lesson)

1. Material or Waste Information
   ≈2 hours
   a. Definition of TRU mixed waste
   b. Emergency actions in the event of a spill or leaking or punctured container of TRU mixed waste
   c. This module describes the information found in the supplier information section of a Material Safety Data Sheet (MSDS)
   d. This information is used in the event the user of the material needs more information than what is included in the particular MSDS
   e. Information
      1. This module describes the product's individual ingredients, relative concentration, and the exposure limit for each ingredient
   f. Physical/Chemical Data
      1. This module describes the chemical and physical properties of the material including; boiling point, specific gravity, melting point, vapor pressure, vapor density, evaporation rate, solubility, pH, and volatility

2. Hazard Data
   ≈2 hours

   a. This module describes the fire and explosion hazards of the particular material including; flash point, lower explosive limit, upper explosive limit, auto-ignition temperature, NFPA 704M Hazard Classification Rating, fire extinguishing media, special fire fighting procedures, unusual fire and explosion hazards, toxic gases produced, and explosion data
   b. Reactive Data Module
      1. This module describes the material's reactivity characteristics including stability, incompatibility, decomposition, and polymerization
   c. Health Hazards Data Module
      1. This module describes the different ways the user may be exposed to the material and the adverse effects the material may have on the body including; lethal dose 50% (LD_{50}), lethal concentration 50 % (LC_{50}), target organ effects, carcinogenicity, acute and chronic effects, and emergency first aid procedures

3. Safety
   ≈2 hours

   a. This module describes the precautions for the safe handling of the material including steps to take in the event the material is spilled, waste disposal method (EPA hazardous waste numbers), regulatory requirements (SARA Title III hazard categories/lists and CERCLA Hazardous Substance classification), labeling of containers, protective equipment, and site specific requirements
   b. Control Measures Module
      1. This module describes safety control measures to take when using the material including respiratory protection, ventilation requirements, work/hygiene practices and site specific requirements
   c. Personal Protective Equipment Module
      1. This module describes the purpose of personal protective equipment (PPE), the categories of protection, EPA Levels of Protection (A,B,C,D), PPE material and chemical resistance. In this module the donning and doffing of Level D PPE is demonstrated. The students are given an opportunity to practice and then are evaluated by completion of a Job Performance Measure.

4. Demonstration
   ≈1 hour

   a. The effects the hazardous material has on various types of PPE material (degradation, permeation, and penetration effects), other common materials and neutralization effects are demonstrated

All times are approximate and do not reflect additional time spent on topics that arise due to class participation, student breaks, class size, and/or practical exercises. (i.e., Job Performance Measures)

1

COURSE: HWR-101 - Hazardous Waste Responder

DURATION: 20 hours

PREREQUISITES: GET-19X/GET-20X/GET-21X
Medical Physical
SAF 630/631- Respiratory Protection
HWW 101 - Hazardous Waste Worker

SCOPE: The instructor will present updated information needed for personnel who respond to hazardous material and/or hazardous waste emergencies at the WIPP site.

TYPE: Classroom and Field Exam

OBJECTIVES: Upon completion of this course, the student will be able to respond to hazardous materials emergencies at the WIPP site.

Mastery of the terminal objective will be demonstrated by scoring 80 percent or higher on the post course examination, satisfactory performance on the job performance measure for donning and doffing Personal Protective Equipment, and participate as a team in the final practical.

REFRESHER: HWR-101A Annually

COURSE DESCRIPTION

1. Regulatory Requirements ≈1 hour
   a. 29 CFR 1910.120

2. Evaluation of Incident ≈3 hours
   A. (Types of Information)
      a. Physical data
         1. color
         2. odor
         3. sound
      b. Cognitive
      c. Technical

   B. Dispatch and Initial Response Phase
      a. Primary focus information
      b. CMR information
      c. During a response

   C. Product Information
      a. Product identification
      b. Primary and secondary hazards

D. Incident Elements
   a. Spill
   b. Leak
   c. Fire

E. Incident Priorities

3. Response Operations
   ≈1 hour
   A. Size-up, Strategy, and Tactics
      a. Size-up
         1. Monitoring atmospheric conditions near the release
            a. Weather conditions
            b. Organic vapors, gases, particulates
            c. Oxygen deficiency
            d. Specific materials
            e. Combustible gases
            f. Inorganic vapors, gases, particulates
            g. Radiation
         2. Visual observations
         3. Unusual odors
         4. Off-site samples
         5. Entry team procedures
            a. Monitoring on-site ambient air
            b. Types of containers and impoundments
            c. Physical condition of material
            d. Leaks or discharges
            e. Labels and markings
         6. Additional considerations
            a. Type, condition, and behavior of container
            b. Resources and control measures
         7. Summary of size-up
      b. Strategy and tactics
         1. Definitions
         2. Strategy
         3. Tactics
         4. Rescue
         5. Prevent container failure
         6. Containment
         7. Confinement
         8. Remove ignition sources
         9. Extinguish fires
         10. Tactical withdrawal

B. Incident Command System and Mitigation Plan at the WIPP
≈1 hour

a. Key elements required
b. Key personnel and functions
   1. Incident commander
   2. Science officer
   3. Safety officer
   4. Records keeper
   5. Medical officer
   6. Resource officer
   7. Operations officer
c. Implementing response operations
   1. Organize
   2. Evaluate the situation
   3. Develop a plan of action

4. Safety
≈5 hours

A. Responder Protection

a. Pre-entry evaluation
b. Deny entry
c. Hydration
d. Pre-entry briefing
e. Post-exit evaluation
f. Support location
g. Environmental temperature monitoring

B. Personal Protective Equipment

a. Selection of appropriate PPE
   1. Levels
      a. Level A
      b. Level B
      c. Level C
      d. Level D
   2. Optional equipment
   3. Manufacturer recommendations/testing
      a. Gloves

C. Donning and Doffing Level A PPE

D. Job Performance Measures

a. Students will Don and Doff Level A PPE with a partner

E. Decontamination

F. Emergency Medical Services

5. Table-top Drill
≈2 hours

6. Course Review

7. Written Examination

8. Practical
   ≈5 hours

   a. Objective
   b. Demonstration
   c. Equipment needed
   d. Have students develop Incident Commander and System
   e. Evaluation

All times are approximate and do not reflect time spent on additional topics that arise due to class participation, student breaks, and/or practical exercises. (i.e., Job Performance Measures)

COURSE: HWR-101A - Hazardous Waste Responder, Refresher

DURATION: ≈8 hours

PREREQUISITES: HWR-101

OBJECTIVES: Upon Completion of this course, the student will be able to respond to hazardous materials emergencies at the WIPP site.

Mastery of the terminal objective will be demonstrated by satisfactory performance on the job performance measure for donning and doffing Personal Protective Equipment (PPE), and successfully participate as a team in the final practical

REFRESHER: Annually

COURSE DESCRIPTION

1. Review of HWR-101
   ≈2 hours

2. Changes in Regulations, procedures, and polices
   ≈2 hours

3. Lessons Learned
   ≈2 hours

4. Conclusion and Exam
   ≈2 hours

All times are approximate and do not reflect additional time spent on topics that arise from class participation, student breaks, class size and/or practical exercises (i.e., Job Performance Measures)

1

COURSE: HWS-101 - Hazardous Waste Worker Supervisor

DURATION: ≈8 hours

SCOPE: This course will provide the students with the knowledge necessary to identify factors affecting individual and corporate liability under applicable hazardous waste laws and regulations. Students will be able to state the stages of criminal and civil litigation, identify the types of behavior that leads to criminal prosecution, and identify appropriate actions to ensure compliance with applicable hazardous waste operations.

TYPE: Classroom

OBJECTIVES: Upon completion of this course, the student shall be able to perform supervisory functions in compliance with policies, procedures, and regulations, with regard to hazardous waste management.

Mastery of the terminal objective will be demonstrated by scoring 80 percent or higher on the course examination.

REFRESHER: HWS 101A annually

COURSE DESCRIPTION (by lesson)

1. Liability and Responsibility
   ≈3 hours
   a. General requirements
   b. Definitions and key liability concepts
   c. Mental element in criminal litigation
   d. Typical litigation chronology
   e. Civil and criminal penalties under OSHA
   f. Criminal penalties under environmental laws
   g. Federal sentencing guidelines
   h. Mitigation credit under Federal Sentencing Guidelines
   i. Who will be defendants
      1. Direct involvement
      2. Direct supervisory involvement
      3. Indirect involvement and Responsible Corporate Officer doctrine
   j. Representation
   k. Indemnification
   l. Scope of employment
   m. Types of criminal cases being pursued
   n. Recommended actions

o. Illustrative cases
   1. Knowledge
   2. Sovereignty
   3. Multiple prosecutions
   4. Pervasiveness of liability
   5. Potential for catastrophic corporate consequences
p. Conclusions

2. Health and Safety Program ≈3 hours
   a. Purpose
   b. Authority
   c. Supervisor responsibilities
      1. Hazard control
      2. Hazardous waste management
      3. Hazardous materials management
         a. Training
         b. Storage and handling
         c. Labeling containers
         d. General precautions and practices
   d. Personal protective equipment

   A. Industrial Hygiene
      a. Exposure limits
      b. Conversion and comparison of PPM

   B. Spill Containment (Emergency Response)
      a. Spill response plan

   C. Site Control
      a. Zoning

   D. Decontamination

   E. Reporting Requirements

3. Conclusion ≈1 hour

All times are approximate and do not reflect additional time spent on topics that arise from class participation, student breaks, class size, and/or practical exercises (i.e. Job Performance Measures)

COURSE: HWS-101A - Hazardous Waste Worker Supervisor-Refresher

DURATION: ≈8 Hours

PREREQUISITES: HWS-101

TYPE: Classroom

OBJECTIVES: Upon completion of this course, the student will be able to perform supervisory functions in compliance with policies, procedures, and regulations with regard to hazardous waste management

Mastery of the terminal objective will be demonstrated by scoring 80% or higher on the course examination.

REFRESHER: Annually

COURSE DESCRIPTION (by lesson)

1. Review of HWS-101
   ≈2 hours
   a. Liability and Responsibility
   b. Health and Safety Program
2. Changes in regulations, procedures, policies
   ≈2 hours
3. Lessons Learned
   ≈2 hours
4. Conclusion and Exam
   ≈1 hour

All times are approximate and do not reflect additional time spent on topics that arise from class participation, student breaks, class size, and/or practical exercises (i.e. Job Performance Measures)

1

COURSE: SAF-630/631 - Respiratory Protection

DURATION: ≈8 hours

PREREQUISITES: Medical physical

TYPE: Classroom and Practical

SCOPE: This program contains the requirements of respiratory protection as outlined in 29 CFR 1910.134, 10 CFR 20, ANSI, Z88.2-1980 and applicable WIPP procedures.

OBJECTIVES: Upon completion of this course the trainee will demonstrate a knowledge of the WIPP respiratory protection program; respiratory health hazards; and types of respiratory protection devices, their proper use and limitations.

Mastery of the terminal objective will be demonstrated by scoring 80% or higher on a closed book lesson examination.

COURSE DESCRIPTION (by lesson)

1. Introduction
   ≈2 hours
   A. Basic Requirements
      a. Regulations
      b. DOE Orders
      c. Industry Standards
      d. WIPP Procedures
         1. Physical exam
         2. Pulmonary test
         3. Training
         4. Fit Testing
         5. Identification of potential respirator activities
         6. Selection of Respirators
         7. Respirator usage, storage and sanitation

B. Nature, Extent, and Effects of Respiratory Hazards and the Need for Protection
   a. Human Respiratory System
   b. Respiratory Hazards
   c. Contaminants (Identification)
      1. Physical Properties
      2. Chemical Properties
      3. Concentration
      4. Warning Properties
      5. MSDS
      6. Toxicology
         a. Gases/Vapors
         b. Particulates

C. Engineering and Administrative Controls
   a. Hazard Control
      1. Engineering Controls
      2. Administrative Controls
   b. ALARA

2. Use of Respirators at WIPP
   ≈2 hours

A. Selection of Respirators
   a. Medical Verification
      1. Physical Exam
      2. Spirometer Testing
   b. Training
   c. Qualitative/Quantitative Fit Testing
   d. Selection Factors
      1. User Acceptance
      2. Psychological/Physiological Complications

B. Air Purifying Respirators
   a. Operation
   b. Limitations/Capabilities
      1. Particulate Air Filters
      2. Chemical Cartridge Respirators

C. Atmosphere Supplying Respirators
   a. Operation
   b. Limitations/Capabilities

D. Respirator Cleaning/Storage
   a. Cleaning Frequency
   b. Maintenance
   c. Storage

E. Respiratory Emergencies
   a. Actions for Air Purifying Respirators
   b. Self Contained Breathing Apparatus (SCBA) Emergency Actions
      1. Buddy System
      2. Regulator Failure
      3. Insufficient Air Flow
      4. Hyperventilation

3. Practical Session
   ≈2 hours
   a. Half-Facepiece, Air Purifying Regulators
      1. Types
      2. Mode of Operation
      3. Protection Factors
      4. Inspection
      5. Donning
      6. Qualitative Test
      7. Cartridge Type
      8. Removal
   b. Full Facepiece, Air Purifying Regulator
      1. Types
      2. Mode of Operation
      3. Protection Factor
      4. Inspection
      5. Donning
      6. Qualitative Test
      7. Removal
   c. Full Facepiece, SCBA
      1. Types
      2. Mode of Operation
      3. Protection Factor
      4. Inspection
      5. Donning
      6. Qualitative Test
      7. Removal

All time are approximate and do not reflect time spent on additional topics that arise due to class participation, student breaks, class size, and/or practical exercises. (i.e., Job Performance Measures)

1

COURSE: SAF-515 - Confined Space

DURATION: ≈12 hours

PREREQUISITES: GET-19X/GET-20X/GET-21X initial training
Medical physical
SAF-630/631 Respiratory Protection
Current OPS-08 Qual Card

SCOPE: The instructor will present hazards, personal protective equipment requirements, emergency action, and compliance with regulatory and WIPP procedures involving confined space. Students will learn emergency retrieval techniques for removal of personnel from confined spaces.

Students will enter a simulated confined space using Personal Protective Equipment (PPE)

TYPE: Classroom and practical

OBJECTIVES: Upon completion of this course, the student will be able to state the requirements for entry into confined spaces, identify hazards which may exist, provide proper monitoring of the environmental conditions of spaces, and provide proper emergency response actions involving employees in distress.

Mastery of the terminal objective will be demonstrated by scoring 80 percent or higher on the course examination.

REFRESHER: SAF-515A Annually

1

COURSE: SAF-515A - Confined Space

DURATION: 4 Hours

PREREQUISITES: SAF-515 - Confined Space Initial Training
SAF-630/631 - Respiratory Protection
Current OPS-08 Qual Card

SCOPE: The instructor will present hazards, personal protective equipment requirements, emergency action, and compliance with regulatory and WIPP procedures involving confined space. The course will also review several confined space fatalities lessons learned.

TYPE: Classroom

OBJECTIVES: Upon completion of this course, the student will be able to describe the WIPP's Confined Space Program

Mastery of the terminal objective will be demonstrated by scoring 80 percent or higher on the course examination

REFRESHER: Annually

1

COURSE: RAD-101 - Radiological Worker I

DURATION: ≈16 hours

PREREQUISITES: Radiation Manager Approval

SCOPE: The instructor will present radiological theory and practical information necessary to allow unescorted entry into a controlled area, radioactive materials area, radiological buffer area, and radiation area as required by the WIPP Radiation Safety Manual.

TYPE: Classroom and Practical

OBJECTIVES: Upon completion of this course, the student will have the knowledge to work safely in areas controlled for radiological purposes.

Mastery of the terminal objective will be demonstrated by scoring 80 percent or higher on the course examination and satisfactory performance on the practical examination.

Completion of the course meets the training requirements necessary for Radiological Worker -I (RWT-I).

REFRESHER: Retraining every two years with an alternate year refresher.

COURSE DESCRIPTION (by lesson)

1. Radiological Fundamentals
   ≈2 hours
   a. Introduction
      1. DOE Safety Policy
      2. Course Overview
      3. Radiological Worker (core academics)
         a. Radiological Worker II (RW II) training
         b. Course outline
         c. Successful completion
   b. Atomic Structure
      1. Basic Units of Matter
         a. Protons
         b. Neutrons
         c. Electrons
      2. Stable and Unstable atoms
      3. Charge of the atom

c. Definitions
    1. Ionization
    2. Ionizing radiation
    3. Non-ionizing radiation
    4. Radioactivity
    5. Radioactive material
    6. Radioactive Contamination
    7. Radioactive decay
    8. Radioactive half-life
d. Four Basic Types of Ionizing Radiation
    1. Alpha particles
        a. Physical characteristics
        b. Range
        c. Shielding
        d. Biological hazard
        e. Sources
    2. Beta particles
        a. Physical characteristics
        b. Range
        c. Shielding
        d. Biological hazard
        e. Sources
    3. Gamma rays/x rays
        a. Physical characteristics
        b. Range
        c. Shielding
        d. Biological hazard
        e. Sources
    4. Neutron particles
        a. Physical characteristics
        b. Range
        c. Shielding
        d. Biological hazard
        e. Sources
e. Units of Measure
    1. Radiation
        a. Roentgen
        b. RAD (Radiation Absorbed Dose)
        c. Rem (Roentgen Equivalent Man)
        d. Radiation dose and dose rate
    2. Contamination/Radioactivity
f. 10 CFR Part 835, “Occupational Radiation Protection”

2. Biological Effects
   ≈1 hour

a. Introduction
b. Sources of Radiation
   1. Natural sources
      a. Cosmic radiation
      b. Sources in earth's crust (terrestrial)
      c. Internal
      d. Radon
   2. Man-made sources
      a. Medical radiation sources
         1. X-rays
         2. Diagnosis and therapy
      b. Atmospheric testing of nuclear weapons
      c. consumer products
      d. Industrial uses
c. Effects of Radiation on Cells
   1. Biological effects
   2. Cell sensitivity
   3. Possible effects of radiation on cells
      a. No damage
      b. Cells repair damage and operate normally
      c. Cells are damaged and operate abnormally
      d. Cells die as a result of damage
d. Acute and Chronic Radiation Dose
   1. Acute radiation doses
   2. Chronic radiation doses
   3. Genetic effects
   4. Factors affecting biological damage due to exposure to radiation
      a. Total dose
      b. Dose rate
      c. Types of radiation
      d. Area of the body which receives a dose
      e. Cell sensitivity
      f. Individual sensitivity
e. Prenatal Radiation Exposure
   1. Sensitivity to the unborn
   2. Potential effects associated with prenatal exposures
f. Risks in Perspective
   1. Risk from exposures to ionizing radiation
   2. Comparison or risks
g. Summary

3. Radiation Limits
   ≈1 hour

   a. Basis and Purposes for Radiation Dose Limits and Administrative Control levels for radiological workers
      1. Bases for DOE dose limits
      2. WIPP administrative control levels
   b. Dose Limits and Administrative
      1. Whole body Control Levels
         a. Definition
         b. Limit and control levels
      2. Extremities
         a. Definition
         b. Limit and control levels
      3. Skin and other organs
         a. Definition
         b. Limit and control levels
      4. Lens of the eye
         a. Definition
         b. Limit and control levels
      5. Declared pregnant worker: Embryo/fetus
         a. DOE policy
         b. DOE limit
         c. Site policy
         d. WIPP administrative control level
      6. Visitors and public
   c. Worker Responsibilities Regarding Dose Limits
   d. Summary

4. ALARA Program
   ≈1 hour

   a. ALARA Program
      1. ALARA Concept
      2. DOE Management Policy for the ALARA program
      3. Site policy
   b. Responsibilities for the ALARA
      1. Management Program
      2. Radiological control organization
      3. Radiological workers
   c. External and internal radiation
      1. Basic protective measures used to Dose Reduction reduce external doses
         a. Time
         b. Distance
         c. Shielding
      2. Additional methods to reduce dose
      3. Lessons learned

d. Internal Radiation Dose Reduction
   1. Pathways
      a. Inhalation
      b. Ingestion
      c. Absorption through the skin
      d. Absorption through wounds
   2. Methods to reduce internal radiation dose
e. Radioactive Waste Minimization
   1. Methods to minimize radioactive waste
   2. Separate radioactive waste from nonradioactive waste
   3. Separate compactable material from noncompactable material
   4. Minimize the amount of waste generated
   5. Use good housekeeping techniques
f. Summary

5. Personnel Monitoring Programs
   ≈1 hour

a. External Dosimetry
   1. Thermoluminescent dosimeters
   2. Direct reading dosimeters
   3. Alarming dosimeters
   4. Worker responsibility for external dosimetry
b. External Monitoring
c. Worker Dose Records
d. Summary

6. Radiological Postings and Controls
   ≈2 hours

a. Radiological Work Permits
   1. Use
   2. Types
      a. General radiological work permit
      b. Job specific radiological work permit
   3. Information to be included on the permit
   4. Worker responsibilities
b. Radiological postings
   1. Uses
   2. Requirements
   3. Responsibilities of the worker associated with postings, signs, and labels
   4. Consequences of disregarding radiological postings, signs, and labels
   5. Requirements for entry, exit, and area working in radiologically posted areas

c. Radiological areas
    1. Radiological buffer areas
        a. Posting requirements
        b. Minimum requirements for unescorted entry
        c. Requirements for working in RBAs
        d. Requirements for exit
    2. Radiation areas
        a. Posting requirements
        b. Minimum requirements for unescorted entry
        c. Requirements for working in area
        d. Requirements for exit
    3. Contamination areas
        a. Posting requirements
        b. Require special training
    4. High contamination areas
        a. Posting requirements
        b. Require special training
    5. Airborne radioactivity areas
        a. Posting requirements
        b. Require special training
    6. Radioactive materials areas
        a. Posting requirements
        b. Minimum requirements for unescorted entry
        c. Requirements for working in area
        d. Requirements for exit
    7. Fixed contamination area
        a. Posting requirements
        b. Contact radiological control for entry requirements
    8. Soil contamination area
        a. Posting requirements
        b. contact radiological control for entry requirements
    9. Underground radioactive materials area
        a. Posting requirements
        b. General requirements
    10. Hot spots
        a. Posting requirements
d. Summary

6. Radiological Emergencies
   ≈1 hour
   a. Emergency alarms and responses
      1. Area radiation monitors (ARMs)
      2. Continuous Airborne Monitors (CAMs)
   b. Disregard for radiological alarms
   c. Radiological emergency situations
   d. Considerations in Rescue and Recovery Operations
   e. Summary

7. High/very High Radiation Area Training
   ≈1 hour
   a. Definitions
      1. High radiation area
      2. Very high radiation area
   b. Signs and postings
   c. General entry, work, exit
      1. Entry requirements
      2. Working requirements
      3. Exit requirements
   d. Access controls
      1. Administrative controls
      2. Physical controls
      3. Consequences for violating radiological signs or postings or bypassing physical access controls
   e. Response to area radiation alarms and unusual conditions
   f. Considerations in Rescue and Recovery Operations
   g. Summary

8. Written Examination and Review
   ≈1 hour

9. JPM Review and JPM Evaluations
   ≈4 hours

All times are approximate and do not reflect time spent on additional topics that arise from class participation, student breaks, class size and/or practical exercises. (i.e., Job Performance Measures)

1

COURSE: RAD-201 - Radiological Worker II

DURATION: ≈8 hours

PREREQUISITES: Radiation Manager Approval

SCOPE: The instructor will present an intensive course intended for the radiological workers whose job assignments involve unescorted entry to high and very high radiation areas, contamination areas, high contamination areas, and airborne activity areas.

TYPE: Classroom and Practical

OBJECTIVES: Demonstrate the ability to work safely in radiologically controlled areas, use ALARA techniques in accordance with WIPP radiation protection procedures

Mastery of the terminal objective will be demonstrated by scoring 80 percent or higher on the course examination and satisfactory performance on the practical examination

REFRESHER: Retraining every two years with an alternate year refresher

COURSE DESCRIPTION (by lesson)

1. Radioactive Contamination
   ≈3 hours
   a. Plutonium
   b. Comparison of ionizing radiation
      1. Ionizing radiation and radioactive contamination
      2. Radioactive contamination
      3. Radiation is energy, contamination is material
   c. Types of contamination
   d. Sources of radioactive contamination
      1. Sources
      2. Indicators of possible area contamination
      3. Employee response to a spill
   e. Contamination control methods
      1. Preventable methods
      2. Engineering control methods
      3. Personal protective measures
         a. Protective clothing

f. Contamination monitoring equipment
   1. Purpose
   2. Types and uses
   3. Frisking
g. Decontamination
   1. Personnel decontamination
   2. Material decontamination
      a. General considerations
      b. Methods available
      c. Techniques
h. Contamination control requirements
   1. Posting requirements
   2. Requirements for entering
   3. Donning double PC's
   4. Exit requirements
   5. Method for removing items from contamination areas
i. Unusual events involving radioactive materials
   1. Unusual events
   2. Use of the incident command system
   3. Actions of emergency responders
   4. Response techniques
j. Identification of radiation hazards
   1. Placards
   2. Labels
   3. Shipping papers
k. Field operation protocol for radiation accidents

2. Practical Examination and review
   ≈1 hour

3. JPM Review and JPM Evaluations
   ≈4 hours

All times are approximate and do not reflect additional time spent on topics that arise from class participation, student breaks, class size, and/or practical exercises. (i.e., Job Performance Measures)

1

COURSE: TRG-293/298 - Subject Matter Expert and On-the-Job Training

DURATION: ≈4 hours

PREREQUISITES: Manager Approval

TYPE: Classroom

SCOPE: The instructor will provide the training skills and knowledge necessary to perform the role of subject matter expert (SME)/on-the-job trainer (OJT).

OBJECTIVES: Upon completion of this course the student will be able to perform the instructional duties of a Level I Instructor (SME/OJT trainer) In compliance with WIPP training policies.

Mastery of the terminal objective will be demonstrated by scoring 80 percent or higher on the course examination.

REFRESHER: Every Two Years

COURSE DESCRIPTION (by lesson)

1. Requirements for Qualification
   ≈.5 hour
   a. Qualification card
   b. Designation letter to training
   c. Training course
   d. SME Qualification Board
   e. Arranging the SME Board
   f. Conduct of the Board
   g. Maintaining qualification
   h. Lapses in qualification

2. Role of the Level I Instructor
   ≈1 hour
   a. Conduct formal OJT
   b. Develop/revise qualification cards
   c. Maintaining files related to area of expertise
   d. Limitations of Level I Instructors

3. On-The-Job (OJT) Training
   ≈1 hour
   a. Definition
   b. Formal training vs. informal training
   c. Process for OJT
      1. Introduction phase
      2. Explanation phase
      3. Knowledge evaluation phase
      4. Demonstration phase
      5. Practice phase
      6. Practical evaluation phase
      7. Rules
   d. Trainee failures or slow learners
   e. Good OJT practices
   f. Common OJT instructor errors

4. Qualification Cards
   ≈1 hour
   a. Purpose
   b. Elements
   c. Writing competency statements
   d. Selecting competency statements for requalification
   e. Reviewing qualification cards

5. Qualification Guide
   ≈.5

All times are approximate and do not reflect additional time spent on topics that arise from class participation, student breaks, class size, and/or practical exercises. (i.e., Job Performance Measures)

1

COURSE: TRG-300 - Classroom Instructor - Level II

DURATION: ≈40 hours

PREREQUISITES: Manager's approval

SCOPE: The Instructor will present the student with the information and skills necessary to develop and preform classroom instruction based on DOE guideline "Good Practice For Training And Qualification of Instructors" DOE-HDBK-1001-96.

TYPE: Classroom and Practical

OBJECTIVES: Upon completion of this course the student will be able to develop, conduct, and document formal classroom training in compliance with current WIPP training policies.

Mastery of the terminal objective will be demonstrated by satisfactory performance on all practical sessions and maintaining 80 percent or higher for an overall course Average. No score less than 70 percent may be scored on any daily examination.

REFRESHER: TRG-292 Every six months

COURSE DESCRIPTION (by lesson)

1. Introduction
   ≈1 hour
   a. Course title
   b. Course terminal objective
      1. Part I
      2. Part II
   c. Course topics
      1. Qualities of a competent instructor
      2. Adult learning principles
      3. PBT
      4. Training settings
      5. Learning objectives
      6. Test development
      7. Development of lesson plans
      8. Use of instructional aids
      9. Presentation and facilitation skills
      10. Effective questioning techniques
      11. Behavioral problems
      12. Demonstration method
      13. Evaluations

	14. Administration 15. Final practical examination a. Subject choices b. Time limit c. Requirements in the lecture d. Evaluation method e. Video taped d. Summary
2. Competencies of a Competent Instructor ≈1 hour	a. Motivator b. Role of the Instructor c. Role of the Level II Instructor 1. Develop instructional materials 2. Conduct formal classroom instruction in their technical area 3. Administer examinations 4. Document formal training d. Reasons for Qualified Instructors e. Categories of Instructor Qualities f. Qualities of competent instructor g. Common pitfalls to an instructor's success h. Summary
3. Adult Learning Principles ≈2 hours	a. Motivator b. Learning defined 1. Learning based on experience 2. Learning as an experience retained by the learner and produces a measurable change in behavior 3. How change can occur 4. Categories of learning c. Learning style d. Instructor learning principles 1. Learning principles and information processing 2. Learning principle equals motivation 3. Learning principle equals digestible chunks 4. Learning principle equals experience 5. Learning principle equals attention 6. Learning principle equals reinforcement 7. Learning principle equals retention 8. Learning principle equals retrieval 9. Learning principle equals transfer 10. Summarize concepts

e. Adults as Learners
   1. Four adult learning principles
   2. Concept of the learner
   3. Role of experience
   4. Readiness to learn
   5. Orientation to learning
   6. Internal summary
f. Barriers to learning in adults
   1. Physical barriers
   2. Emotional barriers
   3. Intellectual barriers
   4. Learning style barriers
g. Summary

4. Overview of PBT/TAP
   ≈1 hour

a. Motivator
b. Performance Based Training
   1. Definition
c. Five Phases of PBT System
   1. Analysis
   2. Design
   3. Development
   4. Implementation
   5. Evaluation
d. Reasons for using the PBT process
e. Definitions of five phases
   1. Analysis
      a. Purpose
      b. Process/products
         1. Job analysis
         2. Task analysis
   2. Design
      a. Purpose
      b. Process/products
   3. Development
      a. Purpose
      b. Process/products
   4. Implementation
      a. Purpose
      b. Process/products
   5. Evaluation
      a. Purpose
      b. Process/products
f. DOE Order
   1. DOE Order 5480.18
h. Summary

5. Methods of Instruction
   ≈1 hour

   a. Motivator
   b. Training sessions
      1. Definition
      2. Training sessions common to DOE
      3. Classroom setting
      4. On-the-Job
      5. Laboratory setting
      6. Self-paced instruction setting
      7. Simulator setting
   c. Setting selection criteria
      1. Setting criteria
   d. Training methods
      1. Lecture
      2. Discussion
      3. Role-play
      4. Self-study
      5. Walk-through
      6. Case study
   e. Summary

6. Development of Learning Objectives
   ≈1 hour

   a. Motivator
   b. Definition of learning objective
      1. Definition
      2. Why write objectives
      3. When to write objectives
      4. Basic assumptions
   c. Component parts of learning objectives
      1. Action statement
      2. Conditions
      3. Standard
      4. Implied conditions and standards
   d. Definition of Terminal Objective
      1. Definition
      2. First sentence
      3. Second sentence
   e. Source of Information for Terminal Objectives
   f. Definition of Enabling Objective
      1. Definition
   g. Information source for enabling objectives
   h. Exercise
      1. Terminal objective
      2. Enabling objective
   i. Summary

7. Methods of Testing
   ≈2 hours
   a. Motivator
   b. Purpose of testing
      1. Purpose of testing
      2. Selection and placement
      3. Feedback to trainers and trainees
      4. Motivation
      5. Improvement to training programs
   c. When are tests developed?
      1. Analysis phase
      2. Design phase
         a. Training settings
         b. Learning objectives
         c. Entry-level skills
         d. Design
         e. Written tests
         f. Oral tests
      3. Development phase
      4. Implementation phase
      5. Evaluation phase
   d. Guidelines for question development
      1. Approved test question formats at the WIPP
         a. True/false
         b. Multiple choice
         c. Matching
         d. Completion/short answer
         e. Draw/label
      2. General guidelines
      3. True/false format
      4. Multiple choice
      5. Matching
      6. Completion/short answer
      7. Draw/label
   e. Approved examination format
      1. Two items per objective
      2. Meet the intent of the objective
      3. Use acceptable format
   f. Examination format
      1. Version vs. multiple exam
      2. Required formats
      3. Approval
   g. Control of examinations
      1. Examination preparation
      2. Administering the examination
      3. Grading examination
   h. Examination failure
   i. Summary

8. Developing Lesson Plans
   ≈2 hours

   a. Motivator
   b. Function of a Lesson Plan
      1. Defined as TAP
      2. Accomplish objective
      3. Promote consistency
      4. Serve as guide
   c. Elements of Lesson Plan format
      1. Cover page
      2. Instructor pages
   d. Definition of “Introduction”
      1. Goal of introduction
      2. Preliminaries
         a. Instructor name and background
         b. Lesson title
         c. Trainee comfort
         d. Solicit participation for questions and comments
      3. Learning objectives
      4. Overview
   e. Development of the Body
      1. Outline content
      2. Topics sequence
      3. Detail of content
   f. Definition of Summary
   g. Summary

9. Development of Instructional Aids
   ≈2 hours

   a. Motivator
   b. Definition of instructional aid
   c. Purpose of instructional aids
   d. General guidelines for instructional aids
      1. Design and development guidelines
      2. Utilization guidelines
   e. Guidelines for the use of visual aids
   f. Writing boards (white and chalk)
      1. Introduction
      2. Development tips
      3. Utilization tips
   g. Flip charts
      1. Introduction
      2. Development tips
      3. Utilization tips
   h. Overhead transparencies
      1. Introduction
      2. Development tips
      3. Utilization tips
   i. Handout materials and study guides/workbooks
      1. Introduction
      2. Purpose
      3. Development tips
      4. Utilization tips
   j. Videos/films
      1. Introduction
      2. Development tips
      3. Introduce video
      4. Utilization tips
   k. Training aids
      1. Transition
      2. Types of training aids
      3. Purpose
   l. Consideration for selecting training aids
   m. Summary

10. Use of Presentation and Facilitation Skills
    ≈2 hours

    a. Motivator
    b. Understanding speaking fears
    c. Presentation skills
        1. Personal space
        2. Body movements/ gestures/eye contact/voice
        3. Exercise
    d. Communications model
    e. Facilitation skills
        1. Transition
        2. Attending skills
        3. Observing skills
            a. Exercise
        4. Listening skills
    f. Summary

11. Effective Questioning Techniques
    ≈2 hours

    a. Motivator
        1. Why trainers do not ask questions
            a. Control
            b. Time
            c. Discomfort for self and trainees
            d. Other
    b. Advantages of questioning
    c. Characteristics of effective questions
    d. Difference between comprehension and interaction questions
    e. Types of questions
        1. Overhead question
        2. Rhetorical question
        3. Direct question
        4. Relay questions
        5. Reverse question
        6. Pointed question
        7. Offensive question
    f. Asking questions
    g. Responding to answers
    h. Summary

12. Handling Behavioral Problems
    ≈1 hour

    a. Motivator
    b. Characteristics of behavioral problems
        1. Argumentative
        2. Belligerent
        3. Bored
        4. Chronic questioner
        5. Clown
        6. Late to class
        7. Monopolizer
        8. Preoccupied
        9. Shy
        10. Slow learner
        11. Superior learner
        12. Exercise
    c. Guidelines for determining
        1. Determining need a personal conference
    d. Guidelines for personal conference
        1. Planning the conference
            a. State the problem
            b. Describe your reaction to the problem
            c. Ask for the trainee view of the situation
            d. Ask the trainee for recommendations
            e. Present your alternatives
            f. Select the best solution from alternatives and develop an action plan
            g. Set specific follow up review dates
        2. Physical arrangement for the conference
        3. Conducting the conference
        4. Strategies for active listening
    e. Methods for correcting behavioral problems
    f. Summary

13. Use of Demonstration Methods
    ≈1 hour

    a. Motivator
    b. Purpose of the demonstration method
    c. Effective areas of demonstration method
        1. Concepts
        2. Manipulative skills
        3. Attitudes
        4. Practice
    d. Training aids
    e. Advantages and disadvantages
        1. Advantages
        2. Disadvantages
    f. Preparing for the lesson
    g. Steps in the demonstration method
        1. Introduction
        2. Presentation
        3. Practice
        4. Summary
    h. Actual presentation
    i. Exercise
    j. Summary

14. Purpose of Evaluations
    ≈1 hour

    a. Motivator
    b. Definition of evaluation
    c. Purposes of evaluation
    d. Sections of evaluation process
    e. Evaluations performed
        1. Trainee questionnaire
        2. Post training survey (trainee)
        3. Post training survey (supervisor)
        4. Annual instructor observation form
    f. Results of the evaluation
    g. Summary

15. Training Administration
    ≈1 hour
    a. Motivator
    b. Course package
        1. Lesson plan
        2. Exam, quizzes, and JPM's
        3. Trainee handouts
        4. Overheads
        5. Approval
            a. Training records
            b. Cognizant manager
            c. Training manager
            d. Material given back to instructor
    c. Course preparation
        1. Lesson plan
        2. Exams and quizzes
        3. Trainee handouts
        4. Overheads
        5. Paperwork
    d. Training attendance sheet
    e. Post class activities
    f. Summary

16. Final Practical
    ≈6 hours

17. Examinations
    ≈2 hours

18. Work Time
    ≈8 hours

All times are approximate and do not reflect additional time spent on topics that arise from class participation, student breaks, class size, and/or practical exercises. (i.e., Job Performance Measures)

1

COURSE: MED-101 - First Aid and CPR

DURATION: 12 hours

PREREQUISITES: None

SCOPE: The instructor will provide CPR training including one-rescuer CPR, the Heimlich maneuver, and first aid techniques.

TYPE: Classroom and CPR Practical

OBJECTIVES: Upon completion of this course, the student will be able to administer basic first aid and one-rescuer CPR in accordance with the national safety council. Identify heart disease factors, signs, and symptoms of a heart attack and perform one-rescuer CPR and the Heimlich maneuver.

Mastery of the terminal objective will be demonstrated by scoring 80 percent or higher on the course examination and satisfactory performance on the practical examination.

REFRESHER: MED 101A Annually

COURSE DESCRIPTION (by lesson)

1. Definitions and Legal Aspects
   ≈1 hour
   a. Duty to act
   b. Consent for treatment
   c. Abandonment
   d. Good Samaritan law
   e. Confidentiality

2. Assessment
   ≈1 hour
   a. Purpose
   b. Systematic approach considerations
   c. Parts
   d. Scene assessment
   e. Primary survey
   f. Secondary survey

3. Cardiopulmonary Resuscitation (CPR)
   ≈1 hour
   a. Anatomy of cardiovascular system
   b. Physiology of the heart
   c. Anatomy of the respiratory system
      1. Upper airway
      2. Lower airway
      3. Alveoli
      4. Pulmonary arteries, veins, capillaries
   d. Physiology of the respiratory system
   e. Heart disease

Treatment of Various Conditions
≈4 hours

4. Shock
   a. Hypovolemic shock
   b. Fainting
   c. Anaphylactic shock

5. Bleeding
   a. Types
   b. Control
   c. Treatment
   d. AIDS and HBV

6. Head Injury
   a. General information
   b. Scalp lacerations
   c. Skull fractures
   d. Spinal injuries
      1. Treatment

7. Burns
   a. Classifications
   b. Causes
   c. Treatment

9. Heat Related Injuries/Illnesses
   a. Types
      1. Heat cramps
         a. Treatment
      2. Heat exhaustion
         a. Signs and symptoms
         b. Treatment
      3. Heat stroke
         a. Signs and symptoms
         b. Treatment

10. Bone and Joint Injuries
    a. General information
    b. Signs and symptoms
    c. Treatment

11. Summary

12. Written examination

13. Practical
    ≈3 hours

All times are approximate and do not reflect additional time spent on topics that arise from class participation, student breaks, class size, and/or practical exercises. (i.e., Job Performance Measures)

1

COURSE:	MED-101A - First Aid and CPR Refresher
DURATION:	≈8 Hours
PREREQUISITES:	MED-101
SCOPE:	The instructor will provide refresher training Basic CPR (one-rescuer) and basic first aid techniques
TYPE:	Classroom and practical
OBJECTIVES:	Upon completion of this course, the student will able to administer basic first aid and one-rescuer CPR Mastery of the terminal objective will be demonstrated by scoring 80 percent or higher on the course examination and satisfactory performance on the practical examination
REFRESHER:	Annually

1

COURSE: HMT-102 - Hazardous Materials and Waste Transportation

DURATION: ≈16 Hours

PREREQUISITES: Manager approval and/or assignment to transportation duties in accordance with 49 CFR

SCOPE: Instruction meeting 49 CFR 172 Subpart H provided in a modular format. This course covers: awareness, the hazards material table, packaging, marking, labeling, placarding, material separation and segregation, special or unique transportation moves, safety, and site specific transportation issues.

TYPE: Classroom lecture including exercises to enhance trainee learning and retention

OBJECTIVES: Upon completion of the course, the trainee will be able to define, locate, apply and maintain compliance with the DOT regulations involving the transportation and/or offering for transportation of a hazardous material or waste.

Mastery of this objective will be demonstrated by scoring a minimum of 80 percent on the course examinations using “approved course” reference material.

REFRESHER: Biennially

COURSE DESCRIPTION (by lesson)

1. Awareness/familiarization
   ≈1 hour
   a. Introduction
      1. Instructor
      2. Lesson
      3. Course content
      4. Lesson objectives
   b. Lesson materials
      1. Department of Transportation (DOT) Regulations
         a. Brief history
         b. Purpose
         c. Scope
         d. Terminology
         e. Application of regulations

2. Training programs
    a. Module assignments
        1. Basic modules
        2. Additional modules
c. Training program objectives
d. Training requirements
e. General transportation responsibility
f. General transportation liability
g. Potential exposures
    1. Number of shipments
    2. Events leading to exposures
    3. Causes for events
h. Compliance mandate
    1. Regulator responsibility
    2. Penalties
    3. Trends
i. DOE guidance
    1. DOE Orders
    2. Interaction of DOE Orders and Federal Regulations
j. Enforcement
k. Application of DOT Regulations at DOE facility
l. Introduction to Title 49 CFR
    1. Overview transportation regulations
    2. Navigating within the code book
m. Shippers acronym
n. Standardized DOT communications
o. Summary
p. Review
q. Questions and answer

2. The Hazardous Materials Table ≈3 hours

a. Introduction
b. Lesson body
    1. Lesson objectives
c. Shipper's Star
d. Definition
    1. Hazardous material
    2. Hazardous waste
    3. Hazardous substance
e. Hazard classes
    1. 9 classes
    2. Special cases
    3. Class system
    4. Identification
    5. Shipper's responsibility
    6. Material identification

f. The Hazardous Materials Table
   1. 10 columns
   2. Navigating the hazardous materials table
g. Summary
h. Review
i. Questions and answers

3. Packaging
   ≈1.5 hours

a. Introduction
   1. Lesson
b. Lesson body
   1. Lesson objectives
c. Terminology
   1. Packaging vs. package
      a. Packaging
      b. Package
d. Identifying packaging by code
   1. Recognition types
   2. Code interpretation for UN packaging
      a. Packaging type
      b. Packaging group
e. Limited quantity packing exemptions
   1. Describe “Limited Quantity”
   2. General criteria
f. Package Acceptance Criteria
   1. Acceptable packaging
   2. Unacceptable packaging
g. Summary
h. Review
i. Questions and answers

4. Marking
   ≈1.5 hours
   a. Introduction
   b. Lesson body
      1. Lesson objectives
      2. Purpose
      3. Material identification
         a. The PSN
         b. UN/UA number
         c. Shipments containing multiple materials
      4. Physical markings
         a. Location
         b. Marking format
         c. PIH
         d. Arrows
         e. Reportable quantities
         f. Consignor/consignee information
      5. Exemptions
   c. Summary
   d. Review
   e. Questions and answers

5. Labeling
   ≈1.5 hours
   a. Introduction
   b. Lesson body
      1. Lesson objective
      2. Purpose
      3. Label selection
         a. HMT table
      4. General placement of labeling
      5. Primary vs. secondary labeling
         a. Primary label
         b. Secondary
      6. Specific labeling requirements
         a. Gas cylinders
         b. Alterative labeling
      7. Mixed shipment in one package
         a. Special requirements
      8. Combination package in one
         a. Special requirements of outer package
   c. Summary
   d. Review
   e. Questions and answers

6. Shipping Papers
   ≈1.5 hours

   a. Introduction
      1. Lesson
   b. Lesson body
      1. Lesson objectives
   c. Types of shipping documents
      1. Standard bill of lading
      2. Waste manifest
   d. Basic components of a proper shipping paper
   e. Specific shipping paper
      1. Shipper information
      2. Quantity of packages
      3. Hazardous materials
      4. Quantity of material
      5. Emergency response information
      6. Certification statement signature
   f. Shipping paper format
   g. Additional information
      1. Hazardous and non-hazardous shipping paper
   h. Emergency information
   i. Summary
   j. Review
   k. Questions and answers

7. Placarding
   ≈1.5 hours

   a. Introduction
   b. Lesson material
   c. Lesson objectives
   d. Purpose
      1. Hazardous material identification
      2. Materials with certain exemptions
   e. Application
      1. Placards should not be used
      2. Selection criteria
         a. Table application
         b. Aggregate gross weight
      3. Authorized placards
         a. Displaying requirements
         b. Placard identification
   f. Shipper's requirements
   g. Other placards
      1. Explosives
      2. Residue
      3. Spontaneously combustible
      4. Organic peroxide
      5. Harmful
      6. Class 9

h. Displaying of subsidiary placards
    1. Criteria
j. Displaying placards
    1. Single trailer or bobtail type truck
    2. Multiple trailers
k. Summary
l. Review
m. Questions and answers

8. Separation and Segregation
   ≈1 hour

a. Introduction
b. Lesson material
    1. Lesson objectives
    2. Purpose
c. The table
    1. Layout
    2. Symbols
d. Summary
e. Review
f. Questions and answers

9. Special and Unique Moves
   ≈1 hour

a. Introduction
b. Lesson material
    1. Lesson objectives
    2. Terminology
        a. Empty
        b. Residue
c. Treatment of “empty” shipments
d. Overpack and salvage drums
    1. Overpack drums
        a. Intended use
        b. Use requirements
    2. Salvage drums
        a. Intended use
        b. Package requirements
e. Shipment of samples
    1. Material identification
    2. Unknown material
f. Summary
g. Review
h. Questions and answers

10. Safety
    ≈1 hour

    a. Introduction
    b. Lesson material
        1. Lesson objectives
        2. Emergency response information
            a. Transportation
            b. Resources
    c. Emergency Response Guide
        1. Purpose
        2. Emergency Response Guidebook layout and overview
    d. Using the emergency
        1. Locate chemical identity in Response Guidebook
        2. Review concerns and response recommendations
    e. Potential risk and actions
        1. Risk
        2. Actions
    f. Response principles
        1. “Never”
        2. Consider
    g. Documentation
        1. DOT Form F5800.1
        2. When to document
    h. Summary
    i. Review
    j. Questions and answers

11. Site Specific Transportation
    ≈1 hour

    a. Introduction
    b. Lesson material
        1. Lesson objectives
        2. Department/sect/individual
            a. Employee involvement for shipment from the WIPP
            b. Material control
            c Procurement
            d. Health physics
            e. Hazardous waste operations (HWO)
    c. The shipping process
    d. Additional information requirements by HWO
    e. Hazardous waste shipments
    f. Summary
    g. Review
    h. Questions and answers

All times are approximate and do not reflect additional time spent on topics that arise from class participation, student breaks, class size, and/or practical exercises. (i.e., Job Performance Measures)

COURSE: HMT-104 - DOT Emergency Response Information

DURATION: ≈3 hours

PREREQUISITES: None

SCOPE: This course is designed to instruct the trainee in the basic concepts of applying DOT Transportation regulations involving shipments from the WIPP site. This course will inform the trainee of information that may be required when responding to an emergency involving transportation of hazardous materials and hazardous waste from the WIPP site.

TYPE: Classroom

OBJECTIVES: Upon completion of this lesson, the trainee will be able to respond to phone request from emergency personnel when hazardous materials or hazardous waste are in transit from the WIPP site that may have been involved in a transportation accident.

Mastery of the terminal objective will be demonstrated by scoring a minimum of 80 percent on the course examination.

REFRESHER: None

COURSE DESCRIPTION (by lesson)

1. Regulations
   ≈.5 hour
   a. Emergency response information
   b. Applicability
   c. Availability

2. Logistics of an Emergency Response
   ≈2.5 hours
   a. Central Monitoring Room Operator response to a request for emergency
      1. Request received at CMR
      2. Requestor need further information
   b. Organization of Emergency Response Guidebook
      1. By placard
      2. By shipping papers
      3. By package hazardous waste label
      4. Highlighted entries
      5. No available reference Information
   c. Log entries
   d. Summary

All times are approximate and do not reflect additional time spent on topics that arise from class participation, student breaks, class size, and/or practical exercises. (i.e., Job Performance Measures)

1

COURSE: SAF-501 - Inexperienced Miner Training

DURATION: 40 Hours

PREREQUISITES: None (Steel-toe shoes/boots required for underground tour)

SCOPE: The instructor will present the required information to allow unescorted underground access

OBJECTIVES: Fulfill all requirements of 30 CFR part 48 for underground access.

Mastery of the terminal objective will be demonstrated by satisfactory performance on all practical sessions and by scoring 80 percent or higher on the daily exams with no score less than 70 percent with post course examination.

REFRESHER: SAF-502 Annually

COURSE DESCRIPTION (by lesson)

1. Introduction
   ≈.5 hour
   a. Paperwork
   b. Course attendance
      1. Required attendance
      2. Special instructions
   c. Overview of the WIPP Underground Operations
      1. Similarity to other mining operations
         a. Potash mining
      2. Differences to other mining operations
         a. Potash mining
         b. Coal mining
   d. Summary

2. Act of 1977
   ≈1 hour
   a. Creation of the Federal Mine Safety and Health Act of 1977
      1. Congressional Act
   b. Purpose
   c. Coverage under the Act of 1977
      1. Mandatory safety and health standards
      2. Inspection rights
      3. Accident investigations
      4. Record keeping
      5. Guidelines for correcting dangerous conditions
      6. Mandatory posing of violations and warnings
      7. Required training
   d. Summary

3. Miner's Representative
   ≈1 hour
   a. Definition
   b. The miner's representative under the Act of 1977
   c. The miner's representative system at WIPP
   d. Protection of the employee
   e. Need for employee participation in the inspection of the site
   f. Summary

4. Reporting of Hazards/Lines of Authority
   ≈1 hour
   a. Hazards
   b. Reporting of hazards
      1. Responsibilities
         a. Miner operator
         b. Supervisor
         c. Employee
   c. Method of reporting
      1. Potential minor hazard
      2. Hazards involving possible imminent dangers
   d. Disciplinary actions and the employee
   e. Need for employee involvement
   f. Summary

5. Self-Rescuer/Respiratory Devices
   ≈1.5 hour
   a. Purpose
   b. Service life
   c. Inspection/Color code
   d. Mine operator quarterly inspection
   e. The self-rescuer
      1. Features
      2. The assembly
   f. Operation
   g. Demonstration
   h. Practical application
   i. Respiratory protection
      1. The WIPP program
      2. Requirements
   j. Summary

6. Entering and Leaving the Mine
   ≈1 hour
   a. Access requirements
      1. Miner training
   b. Qualification period
   c. Lamproom location
      1. Proper safety equipment
      2. Sign-in procedure
      3. Brass tag
   d. Summary

7. Transportation
   ≈1 hour

   a. General
      1. Surface
      2. Underground
   b. Hazards
   c. Hazard preventive equipment
      1. Lighting
      2. Alarms
   d. Personnel warning systems
   e. Interaction with pedestrians
      1. Normal travel patterns
      2. Variations
   f. Samples of hazards
      1. Conveyance
      2. Electric carts
      3. Haulage trucks
      4. Fork lift trucks
   g. Summary

8. Communications
   ≈1.5 hours

   a. WIPP communications systems overview
      1. Personnel
      2. Artificial
   b. System breakdown
      1. Personnel communication
         a. Lamp signals
         b. Hand signals
         c. Appropriate uses
      2. Artificial communications
         a. Commercial telephone
         b. Mine phone
         c. Gia-tronics
         d. Alarms systems
         e. Alarm warning lights
   c. Summary

9. Mine Map
   ≈1 hour

   a. Definitions
   b. Map legends
   c. Directions and locations
      1. Underground reference point
      2. Boundary limits
   d. Primary drifts
      1. North/South
      2. East/West
   e. Drifts by area name
      1. North
         a. East/West
         b. North/South
      2. Other North area drifts
      3. South construction area
      4. South disposal area
   f. Assembly areas
   g. Summary

10. Ventilation
    ≈1.5 hours

    a. Ventilation
       1. General requirements
    b. Intake volume
    c. Intake points
       1. Air Intake Shaft
       2. Salt Handling Shaft
       3. Waste Shaft
    d. Exhaust volume
    e. Primary air-flow routes
       1. North mine area air flow (intake)
       2. North mine area air flow (exhaust)
       3. South mine area air flow (intake)
       4. South mine area air flow (exhaust)
    f. Air quality
    g. Air flow balancing
       1. The plan
       2. Adjustments
       3. Unapproved adjustments
    h. Escapeways
    i. Summary

11. Evacuation and Escape Routes
    ≈2 hours

    a. WIPP underground evacuation procedures
        1. Authorization for evacuation
        2. Notifications
        3. Initial actions
    b. Escapes
        1. Purpose
        2. Primary
        3. Secondary
    c. Non-routine egress
        1. Combination usage
        2. Blocked access
    d. Define a barricade
    e. Function of barricades
    f. Permanent barricades
    g. Temporary barricades
    h. Methods of erecting a temporary barricade
    i. Barricades in relationship with WIPP design
    j. Summary

12. Ground Control
    ≈2.5 hours

    a. Evaluation of ground control
    b. Federal regulations
    c. State mining regulations
    d. WIPP procedures
    e. Introduction to ground control and ventilation
    f. Introduction to barring down and scaling
    g. Demonstration of bar down and scaling techniques
    h. Geological formation at WIPP
    i. Review of class room instruction
    j. Field activities
        1. Identification of bad back or rib
        2. Bar down operations
        3. Scaling down operations
        4. Safety issues
    k. Summary/exam

13. Hazard Recognition
    ≈6 hour

    a. General hazard recognition
        1. Mining as a whole
        2. Comparing WIPP with general mining industry
    b. Mobile equipment
        1. Size
        2. Construction
        3. Other hazards
    c. Ground control
        1. Over confidence in work place
        2. Barriers
        3. Improper installation of control devices
    d. Electrical hazards
        1. Cables
        2. Substations and switch racks
        3. Unauthorized personal equipment
    e. Loss of ventilation
        1. Air quality
        2. Radiation
    f. Housekeeping
        1. General
        2. Risk to personnel
    g. Laser operations
    h. Seismic activity
    i. Summary

14. Health
    ≈1 hour
    a. Air quality
        1. Dust
        2. Other vapors
        3. Personal protective equipment
    b. Noise
        1. Acceptable working levels
            a. 8 hour shift
            b. Short term
        2. Protection against damage
            a. In-ear protection
            b. Over-the-ear protection
    c. Chemicals
        1. Use
        2. Personal protective equipment
        3. Training
        4. Health effects
        5. Pre-event planning
    d. Potable water
    e. Toilet facilities
        1. Chemical toilets
    f. Waste receptacles
        1. General
    g. Food consumption
        1. Restriction
    h. Radiation exposure
        1. ALARA
        2. External
        3. Internal
        4. Through wounds
    i. Summary

All times are approximate and do not reflect additional time spent on topics that arise from class participation, student breaks, class size, and/or practical exercises. (i.e., Job Performance Measures)

1

COURSE: SAF-502 - Mine Safety-Experienced Miner Refresher

DURATION: ≈8 Hours

PREREQUISITES: SAF-501

SCOPE: The instructor will update personnel of any change or modification in the underground

TYPE: Classroom

OBJECTIVES: Fulfill requirements of 30 CFR part 48, for annual experienced miner refresher training

Mastery of the terminal objective will be demonstrated by scoring 80 percent or higher on the course examination

REFRESHER: Annually

COURSE DESCRIPTION (by lesson)

1. Introduction
   ≈.5 hour
   a. Hand out 5000-23 MSHA Forms
   b. Workplace overview
      1. Ground control
      2. Electrical
      3. Air quality
      4. Equipment
         a. Accidents
         b. Fires
         c. Noise
   c. Summary

2. Authority and Responsibility of Supervisors, Miner's Representatives
   ≈.5 hour
   a. Miner's representative
   b. Miner's rights and responsibilities
   c. Normal reporting of safety issues
   d. Safety issues with eminent danger
      1. Verbal notification
      2. Protection from reporting safety issues
      3. Work refusal
   e. Summary

3. Ventilation
   ≈1 hour
   a. Intake volume
   b. Intake points
      1. Air Intake Shaft
      2. Salt Handling Shaft
      3. Waste Shaft
   c. Exhaust volume
      1. Exhaust Shaft
      2. EFB capabilities
   d. Primary air-flow routes
      1. North mine area air flow (intake)
      2. North mine area air flow (exhaust)
      3. South construction air flow (intake)
      4. South construction air flow (exhaust)
      5. South disposal area air flow (intake)
      6. Waste Shaft station area
   e. Air quality
      1. Required testing
      2. Ventilation failure
      3. Adjustments
      4. Unapproved adjustments
   f. Summary

4. Ground Control
   ≈1 hour
   a. Ground control
      1. General employee responsibility
      2. Typical ground failures
      3. Ground control practices
   b. Summary

5. Entering and Leaving the Mine Transportation and Controls
   ≈.5 hour
   a. Underground access procedure
      1. General employee responsibility
      2. Violation of restricted areas
   b. Personal protective equipment
   c. Transportation
      1. The conveyance
      2. Mobile equipment
      3. Airlocks and doors
   d. Summary

6. Communication, Warning Alarms and signals
   ≈.5 hour
   a. Communication systems
      1. GTE telephone
      2. Mine telephone
      3. Public address system
   b. Alarm systems
      1. Fire
   c. Emergency staging areas
      1. Assembly areas
      2. Station areas

	d. Alarm notification actions 1. Escapeways 2. Retreat to station for evacuation 3. Retreat to assembly areas e. Summary
7. Mine Map, Escapeway, Emergency Evacuation and Barricades ≈1 hour	a. Escapeways b. Assembly areas 1. Purpose 2. Locations 3. Personnel duties during emergencies c. Barricade equipment d. Summary
8. Accident Prevention ≈.5 hour	a. Event happenings b. Changing events c. Pre-event recognition d. Lessons learned e. Summary
9. Self-Rescuer ≈.5 hour	a. Definition b. Purpose c. Inspections d. Methods of conversion - catalytic conversion e. Protection from deadly gas f. Conversion to what compound? g. Effect time limit h. Compounds and operation i. Practical applications j. Summary
10. First Aid ≈1 hour	a. Basic principles

All times are approximate and do not reflect additional time spent on topics that arise from class participation, student breaks, class size, and/or practical exercises. (i.e., Job Performance Measures)

1

COURSE: RIG-001 - Incidental Rigger

DURATION: ≈16 Hours

PREREQUISITES: None

SCOPE: The instructor will present types of rigging, how to size up the load to be lifted, and the mechanical lifting devices.

TYPE: Classroom

OBJECTIVES: Upon completion of this course, the student will be able to perform incidental rigger duties in compliance with the DOE Standard Hoisting and Rigging Manual DOE-STD-1090-96.

Mastery of the terminal objective will be demonstrated by scoring 80 percent or higher on the course examination.

REFRESHER: None

COURSE DESCRIPTION (by lesson)

1. Identifying Rigging Components
   ≈4 hours
   a. Qualifications
   b. Definitions
   c. Wire rope components
      1. Core
      2. Strand
      3. Wire
   d. Core
      1. Strand
      2. Wire
      3. Lay of the rope
      4. Length of the rope lay
      5. Inspection
   e. Web slings
   f. Polyester slings
   g. Wire rope slings
      1. Inspection
      2. Hooks
      3. Spreader beam
      4. Eyebolts
      5. Shackles - anchor and chain
      6. Wire rope clips - U bolt and twin base
      7. Turnbuckles

2. Inspection and Storage - Weight Calculation
   ≈4 hours
   a. Rigging inspection
      1. Improper sling use
      2. Inspection techniques
      3. Rigging storage
      4. Load weight determination
      5. Calculations
      6. Center of gravity
      7. Slings and hitches
      8. Load angle
      9. Choker hitch rated capacity adjustment
      10. Load cell

3. Identity Lifts/Long Term Check-Out Hand Signals
   ≈4 hours
   a. Load indicating devices
      1. Ordinary lift
   b. Critical lifts
      1. Determination
      2. Requirements
   c. Pre-engineered production lift
   d. Rigging check-out
   e. Long-term checkout
   f. Standard signals and signaler identification

4. Identify rigging Attachments, Accessories and Uses
   ≈4 hours
   a. Beam Clamps
      1. Types
      2. Inspection
      3. Hand operated hoists
         a. Chain hoist
         b. Lever operated hoist
            1. Link chain
            2. Roller chain
            3. Wire rope
   b. Jacks
   c. Using jacks
   d. Cribbing
   e. Cribbing assembly

All times are approximate and do not reflect additional time spent on topics that arise from class participation, student breaks, class size, and/or practical exercises. (i.e., Job Performance Measures)

1

COURSE: OPS-115 - Conduct of Shift Operations

DURATION: ≈8 hours

PREREQUISITES: None

SCOPE: The instructor will describe how shift operation will be conducted at the site.

OBJECTIVES: Upon completion of this course, the student will be able to perform their job in accordance with Operations Department "Conduct of Operations" WP 04-CO.

Mastery of the terminal objective will be demonstrated by scoring 80 percent or higher on the course examination.

REFRESHER: NONE

COURSE DESCRIPTION (by lesson)

1. DOE Guidance for Conduct of Operations and Basic Requirements ≈1 hour
   a. DOE Policy
   b. DOE Orders
   c. Conduct of operations sections
      1. Operations organization and administration
      2. Shift routines and operating practices
      3. Control area activities for the WIPP
      4. Communications
      5. Control of on-shift training
      6. Investigation of abnormal events
      7. Notifications
      8. Control of equipment and system status
      9. Tagouts and lockouts
      10. Independent verification
      11. Logkeeping
      12. Operations turnover
      13. Operations aspects of facility unique processes
      14. Required reading
      15. Timely orders to operators
      16. Operations procedures
      17. Operator aid posting
      18. Equipment and piping labeling

d. Operations organization and administration
   1. Operations Policies
   2. Resources
   3. Monitoring of operating performance
   4. Accountability
   5. Planning for safety
e. Procedures
   1. Use of procedures
   2. Working copies

2. Sections of Conduct of Operations
   ≈5 hours

A. Communications
   a. Emergency communications
   b. Public address system usage
   c. Contacting operators
   d. Radios
   e. Abbreviations and acronyms
   f. Oral instructions and informational communications

B. Control Area Activities
   a. Control area access
   b. Professional behavior
   c. Monitoring the main control panels
   d. Control operator ancillary duties
   e. Operation of control area equipment

C. Control of Equipment and System Status
   a. Status change authorization and reporting
   b. Equipment and systems alignment
   c. Equipment locking and tagging
   d. Equipment deficiency identification and documentation
   e. Work authorization and documentation
   f. Equipment post-maintenance testing and return to service
   g. Alarm status
   h. Temporary modification control
   i. Distribution and control of equipment and system documents

D. Independent Verification
   a. Components requiring independent verification
   b. Occasions requiring independent verification
   c. Verification techniques

E. Operator Aid Postings

F. Equipment and Piping Labeling
   a. Requirements
   b. Identifying labeling deficiencies

G. Shift Requirements	a. Routines and operating practices 1. Status practices 2. Safety practices 3. Operator inspection tours 4. Round/tour inspection sheets 5. Personnel protection 6. Response to indications 7. Resetting protective devices 8. Load changes 9. Authority to operate equipment 10. Shift operating bases
H. Control of On-Shift Training	a. Adherence to training programs b. On-shift instructor qualification c. Supervision and control of trainees d. Operator qualification program approval e. Training documentation f. Suspension of training g. Maximum number of trainees
I. Logkeeping	a. Establishment of operating logs b. Timeliness of recordings c. Information to be recorded d. Legibility e. Corrections f. Log review g. Care and keeping of logbooks
J. Operations Turnover	a. Turnover checklists b. Document review c. Control panel walk-down d. Discussion and exchange of responsibility e. Shift crew briefing f. Reliefs occurring during the shift
K. Operations Aspects of Facility Unique Processes	a. Operator responsibilities b. Operator knowledge c. Operator response to process problems d. Communications between operations and process personnel
L. Required Reading	a. File Index b. Reading assignments c. Required dates for completion of reading d. Documentation e. Review

M. Timely Orders to Operators
   a. Content and format
   b. Issuing, segregating, and reviewing orders
   c. Removal of orders

3. Summary

All times are approximate and do not reflect additional time spent on topics that arise from class participation, student breaks, class size, and/or practical exercises. (i.e., Job Performance Measures)

1

COURSE: TRG-296 - Root Cause Analysis

DURATION: ≈8 hours

PREREQUISITES: None

SCOPE: The instructor will provide personnel with the knowledge and skills necessary to identify the root cause of unplanned plant events, in accordance with DOE standards. Students will analyze incidents to identify corrective action necessary to prevent the incidents from recurring. This training is recommended for all operators, technicians, supervisors, and managers.

TYPE: Classroom And Practical

OBJECTIVES: Upon completion of this course, the student will be able to perform root cause analysis in accordance with DOE Order 232.1.

Mastery of the terminal objective will be demonstrated by scoring 80 percent or higher on the course examination and satisfactory performance on the practical examination.

REFRESHER: None

COURSE DESCRIPTION (by lesson)

1. Introduction to Root Cause Analysis ≈2 hours
   a. Case study
   b. Root cause
   c. Other causes
   d. Event
   e. Event/cause relationship
   f. Root cause analysis
   g. Reason for root cause analysis
      1. Overview
      2. Specifics
      3. Concern - employees
      4. Concern - facility
      5. Concern - company permanent image
      6. Concern - public and environment
      7. Concern - economic
      8. Concern - legal

2. Root Cause Analysis Process
   ≈4 hours
   a. Phases and sub-phases
      1. Collect data
      2. Correct
      3. Inform
      4. Follow-up
   b. Phase one - collect data
      1. What to collect
      2. How to collect
      3. Data review
   c. Phase two - assess
      1. Purpose
      2. Methods
      3. Use, advantages, and disadvantages
      4. Event and casual factor charting
      5. Consists of two phases
      6. Cause and effect
      7. Cause and effect charting
   d. Phase three - correct
   e. Phase four - communications
      1. Internal
      2. External
   f. Phase five - follow-up

3. Root Cause Analysis at the WIPP
   ≈1 hour
   a. Investigations
   b. Reportable and non-reportable events
   c. Root cause analysis team report
   d. Reportable events
   e. Non-reportable events
   f. Follow-up

4. Summary
   ≈1 hour

5. Homework

All times are approximate and do not reflect additional time spent on topics that arise from class participation, student breaks, class size, and/or practical exercises. (i.e., Job Performance Measures)

1

COURSE: SAF-645 - RCRA Emergency Coordinator (WIPP Contingency Plan Procedure)

DURATION: N/A

PREREQUISITES: None

SCOPE: This self-paced lesson describes the responsibilities and actions to be taken by the RCRA Emergency coordinator and other emergency response personnel whenever the WIPP Contingency Plan is implemented.

TYPE: Self-paced

OBJECTIVES: Upon completion of this course, the student will be able to perform the duties of RCRA Emergency Coordinator in accordance with established requirements.

Mastery of the terminal objective will be demonstrated by scoring 80 percent or higher on the course examination.

REFRESHER: None

1. State the purpose of the RCRA Contingency Plan.
2. Describe the general responsibilities of the RCRA Emergency Coordinator.
3. Identify the emergency response groups and their responsibilities.
4. State when the Contingency Plan is to be implemented.
5. Describe the criteria for Incident Levels I, II, and III.
6. Describe the types of events that do not implement the Contingency Plan.
7. Describe the activities regarding initial response and notification of emergency response personnel.
8. Describe the actions to be taken when a surface evacuation is declared.
9. Describe the action to be taken when an underground evacuation is declared.
10. State the information that is included in notifications to public safety and regulatory safety agencies.
11. Describe the various means of identifying hazardous materials.

12. Describe the information that is initially provided to the Emergency Coordinator by the EST.

13. Describe the additional information that is collected to conduct a more thorough assessment.

14. Define the 4 criteria that are evacuated in the assessment stage of an incident.

15. State when the RCRA Emergency Coordinator would request assistance from off-site agencies.

16. Describe the actions involved in the control, containment, and correction of an incident.

17. Describe physical and chemical methods of mitigation.

18. Describe the actions that are implemented in the event of a fire.

19. Describe the actions to be taken in the event of an explosion.

20. Describe the actions to be taken in the event of a spill.

21. Describe the actions to be taken in the event of container spills or leakage.

22. State who is responsible for the radiological decontamination of personnel.

23. Describe the response actions to spills, or leaking, or punctured CH and RH TRU mixed waste containers.

24. Describe the actions to be taken in the event of a natural emergency (earthquake, lightning strike, etc.) involving hazardous waste or materials.

25. Describe the response efforts in the event of spalling of ground in the underground.

26. Describe the response efforts in the event of a roof fall in the underground.

27. Describe the events to be completed during the emergency termination phase.

28. Describe the reporting requirements in the event the Contingency Plan is implemented.

COURSE: SAF-632 - Office Warden

DURATION: ≈ 2 Hours

PREREQUISITES: None

SCOPE:

TYPE: Classroom

OBJECTIVES: Upon completion of this course, the student will be able to state the responsibilities and duties of the Office Warden, in accordance with established guidelines, policies, and regulations.

REFRESHER: SAF-632 annually

1. Objectives
   ≈ 10 minutes
   a. Define role of Office Warden
   b. List responsibilities
   c. Describe emergency notification system
   d. Describe purpose of assembly/staging areas

2. Presentation
   ≈ 90 minutes
   a. Role of Office Warden
   b. Office Warden responsibilities
      1. Day-to-day
      2. Emergency situations
      3. Bomb threats
      4. Inclement weather
      5. Personnel accountability w/no assembly
   c. Emergency Notification System
      1. Different evacuation notifications
      2. Reporting emergencies
   d. Assembly/staging areas
      1. Purpose
      2. Locations

3. Review and Exam
   ≈ 20 minutes

All times are approximate and do not reflect additional time spent on topics that arise from class participation, student breaks, class size, and/or practical exercises (i.e. Job Performance Measures)

1

COURSE: SAF-621 - Firefighter I

DURATION: ≈40 hours

PREREQUISITES: None

SCOPE: This class prepares the student to respond to fires. This class is taught by the New Mexico Fire Academy

OBJECTIVES:

REFRESHER: Training is conducted 8 hours quarterly

COURSE DESCRIPTION (by lesson)

1. Inspection
   ≈.5 hour classroom
   a. Common causes of fires and their prevention
   b. Fire protection procedures
   c. Define importance of public relations
   d. Define dwelling inspection procedures

2. Sprinklers
   ≈.5 hour classroom
   a. Identify a fire department sprinkler connection and water motor alarm
   b. Connect hose lines to a fire department connection of a sprinkler or standpipe system
   c. Define how automatic sprinkler heads open and release water
   d. Temporarily stop flow of water from a sprinkler head

3. Overhaul
   ≈2 hours classroom
   a. Demonstrate searching for hidden fires
   b. Demonstrate exposure of hidden fires by opening ceilings, walls, floors, and pulling apart burned material
   c. Demonstrate how to separate and remove charred materials from unburned material
   d. Define duties of fire fighters left at the scene for fire and security surveillance
   e. Identify the purpose of overhaul

4. Salvage
   ≈1.5 hours classroom
   ≈.5 hours practical

   a. Identify the purpose of salvage and its value
   b. Demonstrate folds and rolls of salvage covers
   c. Demonstrate salvage cover throws
   d. Demonstrate the techniques of inspection, cleaning, and maintaining salvage equipment

5. Fire Streams
   ≈1.5 hours classroom
   ≈2.5 hours practical

   a. Define a fire stream
   b. Manipulate a nozzle so as to attack Class A and Class B fires
   c. Define water hammer and at least one method for its prevention
   d. Demonstrate how to open and close a nozzle

6. Fire Hoses, Nozzles, and Appliances
   ≈2.5 hours classroom
   ≈3.5 hours practical

   a. Identify the sizes, types, amounts, and uses of hose carried on a pumper
   b. Demonstrate the use of nozzles, hose adapters, and hose appliances carried on a pumper
   c. Advance dry hose lines of two different sizes from a pumper:
      1. Into a structure
      2. Up a ladder into an upper floor window
      3. Up an inside stairway to an upper floor
      4. Up an outside stairway to an upper floor
      5. Down an inside stairway to a lower floor
      6. Down an outside stairway to a lower floor
      7. To an upper floor by hoisting
   d. Advance charged hose lines of two different sizes from a pumper
      1. Into a structure
      2. Up a ladder into an upper floor window
      3. Up an inside stairway to an upper floor
      4. Up an outside stairway to an upper floor
      5. Down an inside stairway to a lower floor
      6. Down an outside stairway to a lower floor
      7. To an upper floor by hoisting

	e. Demonstrate the techniques for cleaning fire hose, couplings, and nozzles and inspecting for damage f. Connect a fire hose to a hydrant and fully open and close the hydrant g. Demonstrate the loading of fire hose on a fire apparatus and identify the purpose of at least three types of hose loads and finishes h. Demonstrate three types of hose rolls i. Demonstrate two types of hose carries j. Demonstrate coupling and uncoupling of the fire hose k. Work from a ladder with a charged attack line which shall be 1.5" or larger l. Demonstrate carrying hose into a building to be connected to a standpipe m. Demonstrate the methods for extending a hose line n. Demonstrate replacing a burst section of hose line
7. Forcible Entry ≈3 hours classroom ≈1 hour practical	a. Identify and demonstrate each type of manual forcible entry tool b. Identify the method and procedure of properly cleaning, maintaining, and inspecting each type of forcible entry tool and equipment

8. Ladders
   ≈1.5 hours classroom
   ≈2.5 hours practical

   a. Identify each type of ladder and its intended use
   b. Demonstrate the following ladder carries:
      1. One person carry
      2. Two person carry
      3. Three person carry
      4. Four person carry
      5. Five person carry
      6. Six person carry
   c. Raise each type and size of ground ladder
   d. Climb the full length of every type
   e. Climb the full length of each type of ground and aerial ladder carrying fire fighting tools or equipment while ascending and descending
   f. Climb down the full length of a ground and aerial ladder carrying an injured person
   g. Demonstrate the techniques of working from ground and aerial ladders with tools and appliances
   h. Demonstrate the techniques of cleaning ladders

9. Rescue
   ≈5 hour classroom
   ≈1.25 hours practical

   a. Demonstrate the removal of injured persons from immediate hazards practical by use of carries, drags, and stretchers
   b. Demonstrate searching for victims in burning, smokefilled buildings, or other hostile environments
   c. Define the use of a life belt
   d. Define safety procedures as they apply to rescue

10. Self-Contained Breathing Apparatus ≈2 hours classroom ≈2 hours practical	a. Identify at least four hazardous respiratory environments encountered in fire fighting b. Demonstrate the use of all types of self-contained breathing apparatus in a dense smoke environment c. Identify the physical requirements of the wearer, the limitations of the self-contained breathing apparatus, and the safety features of all types of self-contained breathing apparatus d. Demonstrate donning self-contained breathing apparatus while wearing protective clothing e. Demonstrate that the self-contained breathing apparatus is in a safe condition for safe use f. Identify the procedure for cleaning and sanitizing the self-contained breathing apparatus for future use
11. Ropes ≈2 hours class room and practical	a. Identify and describe the purpose for specific knots b. Identify the construction characteristics and appropriate uses of natural and synthetic fiber rope c. Demonstrate tying a bowline knot, a clove hitch, rescue knot, figure of eight knot, a becket or sheep bend, and an overhand safety knot d. Demonstrate the bight, loop, round turn, and half hitch as used in tying knots and hitches e. Using an overhand knot, hoist any selected forcible entry tool, ground ladder, or appliance to a height of 20 feet f. Demonstrate the techniques of inspecting, cleaning, maintaining, and storing rope

12. Ventilation
    ≈5 hours classroom

    a. Define the principals of ventilation, and identify the advantages and effects of ventilation
    b. Identify the dangers present and precautions to be taken when performing ventilation
    c. Demonstrate opening various types of windows from inside and outside, with and without tools
    d. Demonstrate breaking window and door glass and its removal
    e. Using an ax, demonstrate the ventilation of a room and a floor
    f. Define the theory of a back draft explosion

13. Safety
    ≈1 hour classroom

    a. Identify dangerous building conditions created by fire
    b. Demonstrate techniques for action when trapped or disoriented in a fire situation
    c. Define procedures to be used in electrical emergencies
    d. Define fire service lighting equipment
    e. Identify safety procedures when using fire services lighting equipment
    f. Demonstrate the use of portable power plants, lights, cords, and connectors
    g. Define safety procedures as they apply to emergency operations, specifically:
        1. Protective equipment
        2. Team concept
        3. Portable tools and equipment
        4. Riding and apparatus
        5. Hazardous materials incidents

14. Fire Behavior
    ≈3 hours

    a. Define fire
    b. Define the fire triangle and fire tetrahedron
    c. Identify two chemical, mechanical, and electrical energy sources
    d. Define the following stages of fire:
        1. Incipient
        2. Flame spread
        3. Hot smoldering
        4. Flash over
        5. Steady state
        6. Clear burning
    e. Define the three methods of heat transfer
    f. Define the three physical stages of matter in which fuels are commonly found
    g. Define the hazard of finely divided fuels as they relate to the combustion process
    h. Define flash point, fire point, and ignition temperature
    i. Define concentrations in air as it affects combustion
    j. Identify three products of combustion found in structural fires which create a life hazard

All times are approximate and do not reflect additional time spent on topics that arise from class participation, student breaks, class size, and/or practical exercises (i.e., Job Performance Measures)

1

COURSE: EOC-101 - Initial Mine Rescue

DURATION: 20 Hours

PREREQUISITES: Physical, underground experience

SCOPE:

TYPE: Classroom, field, hands-on

OBJECTIVES: Upon completion of this training, the student will be able to wear and maintain a Drager self-contained breathing apparatus, and perform all the functions required as a member of a mine rescue team.

REFRESHER: 48 hours of refresher training is required annually

COURSE DESCRIPTION (by lesson)

1. MSHA 2004 (Drager BG 174-A)
   ≈8 hours
   a. Description
   b. Major parts
   c. Wearing and testing
   d. Limitations
   e. Maintenance

2. MSHA 2202 (Mine Gases)
   ≈2 hours
   a. Meaning of terms
      1. Specific gravity
      2. Explosive range
      3. Toxicity
      4. Asphyxiate
      5. Solubility
   b. Physical properties and characteristics
      1. Normal air
      2. Oxygen
      3. Nitrogen
      4. Carbon dioxide
      5. Carbon monoxide
      6. Oxides of nitrogen
      7. Hydrogen
      8. Hydrogen sulfide
      9. Sulfur dioxide
      10. Methane
   c. Composition, physical properties, and characteristics
      1. Smoke
      2. Rock strata gases
      3. Damps

3. MSHA 2203 (Mine Ventilation)
   ≈2 hours
   a. Purpose and methods
   b. Ventilation controls
   c. Proper chain-of-command when altering ventilation
   d. Air measurement devices
   e. Construction of ventilation controls

4. MSHA 2204 (Mine Exploration)
   ≈2 hours
   a. Examination of mine openings
   b. Barefaced exploration
   c. The fresh air base
   d. Apparatus teams
   e. Briefing
   f. Going underground
   g. Exploration procedures
   h. Traveling procedures
   i. Ground testing
   j. Debriefing

5. MSHA 2205 (Firefighting)
   ≈2 hours
   a. Classification of fires
   b. Firefighting equipment
   c. Firefighting techniques
      1. Indirect
      2. Direct
   d. Explosions

6. MSHA 2206 (Rescue of Survivors)
   ≈2 hours
   a. Rescuing survivors
      1. Rescue techniques
      2. First aid
   b. Recovery of bodies

7. MSHA 2207 (Mine Recovery)
   ≈2 hours
   a. Assessing conditions
   b. Reestablishing ventilation
   c. Clearing and rehabilitating

All times are approximate and do not reflect additional time spent on topics that arise from class participation, student breaks, class size and/or practical exercises (i.e., Job Performance Measures)

1

COURSE: Radiological Control Technician Fundamental Academic Lessons

DURATION: ~52 hours
Students may elect to test out of these courses with Radiological Control Manager approval

PREREQUISITES: Lesson specific

SCOPE: Lesson specific

REFRESHER: Requalification every two years

COURSE DESCRIPTION (by module)

1. Basic Mathematics and Algebra (CL1.01) ≈4 hours

a. Prerequisites - None
b. Scope - This lesson is a review of arithmetic and algebraic methods used to perform various radiological control calculations required by the RCT to perform his/her daily duties. These calculations include scientific notation, unit analysis and conversion, radioactive decay calculations, dose rate/distance calculations, shielding calculations, and stay-time calculations.
c. Outline - Introduction
- Basic math operations with fractions
- Basic math operations with decimals
- Convert fractions to decimals and vice-versa
- Convert percent to decimal and vice-versa
- Basic math operations with signed numbers
- Basic math operations with exponents
- Find rational square roots
- Convert scientific notation to standard form and vice-versa
- Basic math with scientific notation
- Solving equations using the “Order of Mathematical Operations”
- Performing algebraic functions
- Solving equations with common and natural logarithms
- Exam

2. Unit Analysis and Conversion (CL1.02) ≈4 hours

a. Prerequisites - None
b. Scope - This lesson is a review of the unit analysis and conversion process necessary for the RCT to perform air and water sample activity calculations, contamination calculations, and many other applications.
c. Outline - Introduction
- Unit systems of measurement and base units for mass, length and time
- SI prefix values and abbreviations
- Using conversion factors/tables
- Using formulas

- Exam

3. Physical Sciences (CL1.03) ≈4 hours

a. Prerequisites - None
b. Scope - This lesson is a review of basic physics since the RCT may work in environments where materials can undergo changes in state, resulting in changes in the radiological work environment.
c. Outline - Introduction -
   - Work/force/energy in relation to physics
   - Identify and describe four forms of energy
   - State the Law of Conservation of Energy
   - Solid/liquid/gas in regards to shape and volume
   - Basic atom structure
   - Defining physical science terms
   - Identifying symbols
   - Periodic Table element arrangement
   - Identifying Periodic Table layout
   - Defining terms relative to atomic structure
   - Exam

4. Nuclear Physics (CL1.04) ≈4 hours

a. Prerequisites - None
b. Scope - This lesson is designed to provide an understanding of the forces present within an atom.
c. Outline - Introduction
   - Definitions: Nucleon, Nuclide, Isotope
   - Mass-Energy Equivalence Concept
   - Definitions: Mass Defect, Binding Energy
   - Definitions: Fission, Criticality, Fusion
   - Exam

5. Sources of Radiation (CL1.05) ≈4 hours

a. Prerequisites - None
b. Scope - This lesson provides an understanding that radiation sources are not limited to nuclear facilities. The study of radiation sources provides data for:
   - The basis for occupational exposure
   - Showing the effects from high source exposures
   - Assessing the impact on radiation background from nuclear facilities
   - Determining the use of building materials
c. Outline - Introduction
   - Identifying natural background radiation sources
   - Identifying artificially produced radiation sources and dose magnitudes from each source
   - Exam

6. Radioactivity and Radioactive Decay (CL1.06) ≈4 hours

a. Prerequisites - None
b. Scope - This lesson provides an understanding of the radioactive decay processes from different types of radionuclides.
c. Outline - Introduction
   - Neutron to proton ratio
   - Definitions: radioactivity, radioactive decay
   - Characteristics of alpha, beta, and gamma
   - Identifying radioactive decay modes
   - Decay of radioactive nuclides
   - Differences: natural and artificial radioactivity
   - Unstable fission products
   - Three naturally-occurring radioactive families and their end products
   - Identify nuclide attributes with Nuclide Chart
   - Tracing nuclide decay and stable end-product
   - Definitions: curie, Becquerel
   - Definitions: specific activity, half-life
   - Calculate activity using the decay formula
   - Defining exposure, absorbed dose, dose equivalent, and quality factor
   - Defining roentgen, rad/gray, and rem/sievert
   - Exam

7. Interaction of Radiation with Matter (CL1.07) ≈4 hours

a. Prerequisites - None
b. Scope - This lesson provides an understanding of how different types of radiation interacts with different types of matter.
c. Outline - Introduction
   - Define ionization, excitation, bremsstrahlung
   - Defining specific ionization, linear energy transfer (LET), stopping power, range, and W-value
   - Alpha particle energy transfer
   - Energy transfer for beta particulate radiation
   - Gamma photon interaction with matter
   - Kinetic energies of various types of neutrons
   - Slow neutron capture
   - Scattering interactions for fast neutrons
   - Characteristics of materials shielding alpha, beta, gamma and neutron radiations
   - Exam

8. Biological Effects of Radiation (CL-1.08) ≈ 4 hours

a. Prerequisites - None
b. Scope -This lesson provides a basic understanding of the methods in which radiation may cause biological damage so that the RCT may protect themselves and the workers from unnecessary exposure to ionizing radiation.
c. Outline - Introduction
   - Function of various cell structures
   - Effects of radiation on cell structures
   - Law of Bergonie and Tribondeau

- Factors affecting radiosensitivity of cells
- Most and least radiosensitive cells
- Reactions on cells from ionizing radiation
- Definitions: stochastic, non-stochastic effect
- LD 50/30 value for humans
- Somatic effects of chronic radiation exposure
- Three types of acute radiation syndromes and associated exposure levels and symptoms
- Radiation exposure risks to embryo and fetus
- Somatic and heritable effects
- Exam

9. Radiological Protection Standards (CL1.09) ≈ 4 hours

a. Prerequisites - None
b. Scope -This lesson provides an understanding of the history of the development of the limits to show why the current limits of exposure are imposed. This lesson also provides an awareness of the current CFRs and DOE Orders that may affect the RCTs at the work place.
c. Outline - Introduction
   - Role of advisory agencies in developing radcon recommendations
   - Role of regulatory agencies in developing standards and regulations
   - DOE RCM purpose and scope
   - DOE RCM use of “shall” and “should”
   - Exam

10. ALARA (CL1.10) ≈ 4 hours

a. Prerequisites - None
b. Scope - This lesson provides an understanding of the ALARA philosophy and shows the methods for the RCT to establish and maintain the commitment to ALARA that all personnel at the facility must have for a safe radiological work place.
c. Outline - Introduction
   - Base assumptions for ALARA philosophy
   - Collective personnel and individual exposure
   - Effective radiological ALARA program
   - Purposes of pre- and post-job reviews
   - RCT responsibilities for implementation
   - Exam

11. External Exposure Control (CL1.11) ≈ 4 hours

a. Prerequisites - None
b. Scope -This lesson provides an understanding of external exposure reduction and control measures available to the RCT to provide the best coverage and support at the radiological work site.
c. Outline - Introduction
   - Four basic methods for minimization
   - Calculating gamma exposure rates
   - Source reduction techniques
   - Time-saving techniques
   - Calculating remaining allowable dose equivalent or stay time
   - "Distance to radiation sources" techniques
   - Calculating exposure rate or distance for a point source of radiation
   - Calculating exposure rate or distance for a line source of radiation
   - Effects of distance on exposure rates from a plane source
   - Mass and linear attenuation coefficients
   - Defining "density thickness"
   - Density-thickness values for skin, lens of the eye, and the whole body
   - Using equations to calculate shielding thickness and exposure rates for gamma/x-ray radiation
   - Exam

12. Internal Exposure Control (CL1.12) ≈ 4 hours

a. Prerequisites - None
b. Scope - This lesson is designed to familiarize the technician with those actions necessary as a result of the entry of radioactive materials into the body and the basis for those actions.
c. Outline - Introduction
   - Four ways radioactive material enters the body
   - Methods to prevent/minimize entry of radioactive material
   - Defining and distinguishing ALI and DAC
   - Determining basis for ALI
   - Defining "reference man"
   - Using DACs to minimize internal exposure
   - Behavior of radioactive materials in the body
   - Natural reductions of radionuclides in body
   - Relationship between physical, biological and effective half lives
   - Calculating effective half life
   - Medical elimination methods
   - Exam

13. Radiation Detector Theory (CL1.13) ≈ 4 hours

a. Prerequisites - None
b. Scope - This lesson provides a good theoretical understanding of radiological instrumentation to help RCTs understand the data obtained by that instrumentation.
c. Outline - Introduction
   - Fundamental laws of electrical charges
   - Defining current, voltage, resistance, and their respective units
   - Functions of detector and readout circuitry components in radiation measurement system
   - Parameters affecting ion pair numbers in a gas-filled detector
   - Regions of gas amplification curves
   - Characteristics of a detector used in gas amplification curve regions
   - Defining resolving time, dead time, and recovery time
   - Discriminating between various types of radiation and various radiation energies
   - Operation of scintillation detector and associated components
   - Operation of neutron detector
   - Principles of GeLi and HPGe detectors
   - Exam

1

COURSE: Radiological Control Technician Site-Specific Academic Lessons

DURATION: ≈88 hours

PREREQUISITES: Lesson specific

SCOPE: Lesson specific

1. Counting Errors and Statistics (CL2.03) ≈ 4 hours

a. Prerequisites - CL1.01 through CL1.13
b. Scope - This lesson provides a basic knowledge of the random process of detecting and measuring radioactivity and the associated counting errors involved with that process. The RCTs will use this knowledge when obtaining the radioactivity measurements to make decisions that may affect the health and safety of workers at the facility and its surrounding environments
c. Outline - Introduction
   - Analyzing errors and their effect on sample measurements
   - Sample analysis statistics applications
   - Defining mean, median, and mode
   - Determining mean, median, and mode
   - Defining variance and standard deviation
   - Calculating the standard deviation
   - Purpose of Chi-squared test
   - Criteria for acceptable Chi-squared values at the WIPP
   - Purpose of creating quality control charts
   - WIPP QC chart maintenance and review requirements
   - Purpose of warning and control limits
   - Purpose of efficiencies and correction factors
   - Calculating efficiencies and correction factors
   - Meaning of counting data reported as “$x \pm y$”
   - Reporting results to desired confidence level
   - Purpose of determining background
   - WIPP methods and requirements for determining background
   - Purpose of performing sample planchet maintenance
   - WIPP method and requirements of performing planchet maintenance for counting systems
   - Methods to improve statistical validity of sample measurements
   - Defining and explaining “detection limits”
   - Calculate detection limit values at WIPP
   - Purpose, method, and criteria for acceptable values of determining crosstalk at the WIPP
   - Purpose and method of performing voltage plateau
   - Exam

2. Dosimetry (CL2.04) ≈ 4 hours

a. Prerequisites - None
b. Scope - This lesson introduces the types of dosimeters used to measure external radiation to people at the facility. The material presented in this lesson is valuable to RCTs since dosimeters are the only direct method to measure and document personnel radiation exposure and ensure regulatory compliance with applicable limits.
c. Outline - Introduction
   - DOE occupational worker external exposure limits
   - DOE established limits for embryo/fetus
   - WIPP administrative exposure control guidelines for radiation/non-radiation workers, incidents and emergencies, and unborn children
   - Requirements for pregnant worker
   - Theory of operation of a TLD
   - Theory of operation of a TLD reader
   - Advantages and disadvantages of a TLD
   - WIPP beta-gamma TLDs
   - WIPP neutron TLDs
   - WIPP TLD use requirements
   - WIPP personnel neutron dosimeter types and principle of operation
   - WIPP self-reading dosimetry (SRD) principle of operation
   - WIPP alarming dosimeter use guidelines and principle of operation
   - WIPP bioassay monitoring methods
   - Exam

3. Contamination Control (CL2.05) ≈ 4 hours

a. Prerequisites - None
b. Scope - This lesson shows that contamination control is probably one of the most difficult and challenging tasks the RCTs will encounter. This lesson covers the methods to prevent personnel contaminations and releases of radioactive material into the environment which is the ultimate purpose of a radiological control organization.
c. Outline - Introduction
   - Removable and fixed surface contamination
   - Components of the radiation monitoring program
   - Basic goal of the program
   - Basic principles
   - Possible engineering control methods
   - Use of protective clothing
   - Basic factors which determine protective clothing requirements
   - Exam

4. Airborne Sampling Program/Methods (CL2.06) ≈ 4 hours

a. Prerequisites - None
b. Scope - This lesson provides an overview of the air sampling program and the methods for obtaining airborne radioactivity concentration in an area to ensure that the control measures assigned are effective and continue to be effective.
c. Outline - Introduction
   - Primary objectives of air monitoring program
   - Three physical states of radiation contaminants
   - Ensuring a representative air sample
   - Defining “isokinetic sampling”
   - Six methods for obtaining samples and their principle of operation
   - Selection of air monitoring methods
   - Purpose of five types of samplers/monitors
   - Factors affecting accuracy of measurements
   - WIPP air monitoring program
   - Exam

5. Airborne Sampling Laboratory (CL2.06A) ≈ 4 hours

a. Prerequisites - None
b. Scope - This training laboratory provides the initial on-the-job training for the job performance measures (JPMs) pertaining to the Airborne Sampling Program/Methods.
c. Outline - Introduction
   - Collecting FAS filters
   - Analyzing air sample for radioactivity
   - Changing ‘Station A’ FAS filters
   - Determining appropriate respiratory equipment based on air activity

6. Radiological Source Control (CL2.08) ≈ 4 hours

a. Prerequisites - None
b. Scope - This lesson provides an understanding of the purposes, uses, methods to control radioactive sources that are necessary at a nuclear facility.
c. Outline - Introduction
   - N41.1 requirements for radioactive sources
   - WIPP sources that must be controlled
   - Packaging, marking and labeling requests
   - Storage area approval and posting requests
   - WIPP procedures for storage and accountability of radioactive sources
   - Exam

7. Access Control and Work Area Setup (CL2.10) ≈ 4 hours

a. Prerequisites - None
b. Scope - This lesson presents instruction in Radiological Work Permits, various types of postings used in radiological areas, setting up radiological areas, access controls, and releasing of material from radiological areas.
c. Outline - Introduction
   - Purpose and information on Radiological Work Permit (RWP) including WIPP classifications
   - Responsibilities in using or initiating RWP
   - WIPP document that governs our ALARA program
   - WIPP establishment of exposure/performance goals
   - WIPP conditions requiring a pre-job ALARA review
   - WIPP conditions requiring a post-job ALARA review
   - Purpose of postings, signs, labels and barricades; and RCTs responsibilities for them
   - WIPP postings, requirements for postings/barriers, and entry requests for various radiological areas
   - Setting up radiological areas
   - Containment device discrepancies
   - Setting up portable ventilation systems and count rate meters
   - Requirements while working in RBAs
   - Requirements for removing or releasing materials from any radiological area
   - Exam

8. Radiological Work Coverage (CL2.11) ≈ 4 hours

a. Prerequisites - None
b. Scope - This lesson covers the methods of job coverage by RCTs to assist radiological workers in keeping their radiation exposures ALARA.
c. Outline - Introduction
   - Three purposes of job coverage
   - Continuous and intermittent job coverage
   - Conditions that require job coverage
   - Planning job coverage
   - Pre-job briefing discussions
   - Worker and technician exposure control techniques
   - WIPP in-progress radiological surveys
   - WIPP documentation of in-progress surveys
   - Actions taken for unexpected survey results
   - Contamination control techniques
   - Preventative job coverage techniques
   - Overall job control techniques
   - WP 12-5 reasons to stop radiological work activities
   - Exam

9. Shipment/Receipt of Radioactive Material (CL2.12) ≈ 4 hours

a. Prerequisites - None
b. Scope -
c. Outline - Introduction
   - Regulatory agencies for radioactive material transport
   - Defining the DOT terms: LSA, Limited Quantity, Transport Index, Exclusive Use, and Closed Transport Vehicle
     Determining radionuclide contents of a package
   - Radiation and contamination surveys and applicable limits performed on packages
   - Radiation and contamination surveys and applicable limits performed on exclusive use vehicles
   - Placement of placards on transport vehicles
   - WIPP shipment release inspection criteria
   - WIPP procedures for receipt and shipment
   - WIPP procedures for shipments exceeding limits
   - WIPP procedures for opening packages
   - Exam

10. Radiological Incidents and Emergencies (CL2.13) ≈ 4 hours

a. Prerequisites - None
b. Scope - This lesson covers the necessary immediate and supplementary actions for responding to radiological emergencies and abnormal events. This lesson also reveals that, although most people do not take incident response planning seriously because they do not expect the unexpected, incidents do occur, and experience has shown that best response comes from workers who have prepared themselves with a plan for dealing with incidents.
c. Outline - Introduction
   - RCT general response and responsibilities
   - Emergency equipment and facilities, including location and contents of emergency equipment kits
   - RCT response to CAM alarm
   - RCT response to personnel contamination monitor alarm
   - RCT response to off scale or lost dosimetry
   - RCT response to radiation levels or area alarm
   - RCT response to dry or liquid spill
   - RCT response to fire in a radiological area or involving radioactive materials
   - RCT response to other incidents
   - Emergency response levels
   - Incident documentation procedures
   - Emergency response team structure

- Offsite incident support groups
- Plant incidents, including cause, prevention, and response
- Exam

11. Personnel Decontamination (CL2.14) ≈ 4 hours

a. Prerequisites - None
b. Scope - This lesson outlines the best methods available to control or oversee the decontamination of a contaminated individual.
c. Outline - Introduction
   - Three factors in personnel decontamination
   - Required RCT preliminary actions and notifications for contaminated individual
   - RCT response to clothing contamination
   - RCT response to skin contamination
   - Using decontamination reagents to decontaminate personnel
   - Exam

12. Radiological Considerations for First Aid (CL2.15) ≈ 4 hours

a. Prerequisites - None
b. Scope - This lesson introduces the special considerations for injuries in radiological areas. It is incumbent on the RCT to use his/her knowledge and training to make judgement calls based on available facts and conditions. Often there is more than one “right way” to handle the situation, with many alternatives which may all work equally well.
c. Outline - Introduction
   - Treatment of minor radiation injuries
   - Treatment of major radiation illness/injury
   - RCT’s responsibility at scene of major radiation injury after arrival of medical personnel
   - WIPP treatment and transport of contaminated injured personnel
   - Exam

13. Radiation Survey Instrumentation (CL2.16) ≈ 4 hours

a. Prerequisites - None
b. Scope - This lesson provides an understanding of radiation survey instruments to ensure the data obtained is accurate and appropriate for the source of radiation. This lesson contains information about widely used portable radiation survey instruments.
c. Outline - Introduction
   - Appropriate external radiation survey instruments and their selection
   - WIPP ion chamber instrument features and specifications
   - WIPP high range instrument features and specifications
   - WIPP neutron detection and measurement instrument features and specifications
   - Exam

14. Contamination Monitoring Instrumentation (CL2.17) ≈ 4 hours

a. Prerequisites - None
b. Scope - This lesson provides an understanding of contamination monitoring (count rate) instruments to provide the basis for assignment of practical contamination and internal exposure controls, to establish the proper controls, and to identify personnel contamination prior to exiting radiological areas at the facility.
c. Outline - Introduction
   - Portable contamination monitoring equipment selection
   - WIPP beta/gamma and/or alpha survey count rate meter probe features and specifications
   - WIPP count rate instrument features and specifications
   - WIPP personnel contamination monitor features and specifications
   - WIPP contamination monitor (tool, bag, laundry monitors) features and specifications
   - Exam

15. Air Sampling Equipment (CL2.18) ≈ 4 hours

a. Prerequisites - None
b. Scope
c. Outline - Introduction
   - WIPP portable air sampler (PAS) selection
   - Physical and operating characteristics and limitation(s) of WIPP portable air samplers
   - Physical and operating characteristics and limitation(s) of WIPP motor air pumps
   - Pre-operational checkout of WIPP PASs
   - Physical and operating characteristics and limitation(s) of WIPP beta-gamma CAMs
   - Physical and operating characteristics and limitation(s) of WIPP alpha CAMs
   - Exam

16. Counting Room Equipment (CL2.19) ≈ 4 hours

a. Prerequisites - None
b. Scope - This lesson covers counting room equipment in relation to types used, purpose for, radiation monitored, operational requirements, and specific limitations and characteristics. The RCT uses information from these counting instruments to identify and assess the hazards presented by contamination and airborne radioactivity and establish protective requirements for work performed in radiological areas.
c. Outline - Introduction
   - WIPP Scintillation Alpha and Beta laboratory counter/scalers' features and specifications
   - WIPP low background auto alpha/beta proportional counting system features and specifications
   - Exam

1

COURSE: Radiography (Level 1)

TYPE: Classroom/OJT

OBJECTIVES: Upon completion of this course and obtaining a grade of at least 80% on a comprehensive examination, the student will be able to review radiography records performed by another radiographer. Level 1 radiographers will perform a practical capability demonstration in the presence of an experienced, qualified radiography operator or trainer.

REFRESHER: Biennially

COURSE DESCRIPTION

Level 1 radiography operators shall be instructed in the specific waste generating practices and typical packaging configurations expected to be found in each Waste Matrix Code at each site shipping waste to WIPP. The OJT and apprenticeship shall be conducted by an experienced, qualified radiography operator or trainer prior to qualification of the training candidate.

The Permittees' Level 1 radiography training program includes:

Formal Training

- Project Requirements
- State and Federal Regulations
- Basic Principles of Radiography
- Radiography of Waste Forms (including the ability to identify liquid and compressed gases which will be verified by a radiography subject matter expert)
- Waste Stream-Specific Instruction (e.g., specific waste generating processes, typical packaging configurations, waste material parameters)

On-the-Job Training

- System Operation (equipment and procedures used by Level 1 radiographers)
- Identification of Packaging Configurations
- Identification of Waste Material Parameters/Waste Matrix Codes
- Identification of liquid in excess of the limits in the TSDF-WAC, and compressed gases
- Verification of waste stream description

1

COURSE: Radiography (Level 2)

TYPE: Classroom/OJT

OBJECTIVES: Upon completion of this course, the student will be able to perform radiography in a safe manner and will be able to confirm whether waste contains ignitable, corrosive, or reactive waste.

Successfully pass a comprehensive exam based upon training enabling objectives. The comprehensive exam will address the radiography operation, documentation, and procedural elements stipulated in this WAP.

Perform practical capability demonstration in the presence of appointed site Permittee radiography subject matter expert.

REFRESHER: Biennially

COURSE DESCRIPTION

Level 2 radiography operators shall be instructed in the specific waste generating practices and typical packaging configurations expected to be found in each Waste Matrix Code at each site shipping waste to WIPP. The OJT and apprenticeship shall be conducted by an experienced, qualified radiography operator prior to qualification of the training candidate.

The Permittees' Level 2 radiography training program includes:

<u>Formal Training</u>

- Project Requirements
- State and Federal Regulations
- Basic Principles of Radiography
- Radiographic Image Quality
- Radiographic Scanning Techniques
- Application Techniques
- Radiography of Waste Forms
- Standards, Codes, and Procedures for Radiography
- Waste Stream-Specific Instruction

On-the-Job Training

- System Operation
- Identification of Packaging Configurations
- Identification of Waste Material Parameters/Waste Matrix Codes
- Identification of liquid in excess of the TSDF-WAC limits and compressed gases
- Verification of waste stream description

A radiography training drum shall include items common to the waste streams to be confirmed by the Permittees. The training drums shall be divided into layers with varying packing densities or different drums may be used to represent different situations that may occur during radiography examination by the Permittees. The following elements will be in a radiography training drum(s):

- Aerosol can with puncture
- Horsetail bag
- Pair of coveralls
- Empty bottle
- Irregular shaped pieces of wood
- Empty one gallon paint can
- Full container
- Aerosol can with fluid
- One gallon bottle with three tablespoons of fluid
- One gallon bottle with one cup of fluid (upside down)
- Leaded glove or leaded apron
- Wrench

These items shall be successfully identified by the operator as part of the qualification process.

Requalification of operators shall be based upon evidence of continued satisfactory performance (primarily video/audio reviews) and shall be done at least every two years. Unsatisfactory performance will result in disqualification. Unsatisfactory performance is defined as the misidentification of liquid in excess of the limits (as defined in the TSDF-WAC) or compressed gases in a training drum or a score of less than eighty percent (80%) on the comprehensive exam. Retraining and demonstration of satisfactory performance are required before a disqualified operator is again allowed to operate the radiography system for the Permittees.

1

COURSE: Visual Examination (Level 1)

TYPE: Classroom/OJT

OBJECTIVES: Upon completion of this course and obtaining a grade of at least 80% on a comprehensive examination, the student will be able to perform a review of visual examination records and will be able to confirm the Summary Category Group, Waste Matrix Code and whether waste contains ignitable, corrosive, or reactive waste. Level 1 visual examination personnel will perform a practical capability demonstration in the presence of an experienced, qualified visual examination expert or trainer.

REFRESHER: Biennially

COURSE DESCRIPTION

Level 1 visual examination personnel shall be instructed in the specific waste generating processes, typical packaging configurations, and waste material parameters expected to be found in each Waste Matrix Code in the waste stream being confirmed using visual examination.

The OJT and apprenticeship shall be conducted by an operator experienced and qualified in visual examination or a qualified trainer prior to qualification of the candidate. The training shall be site waste stream specific to include the various waste configurations being confirmed. For example, the particular physical forms and packaging configurations at each site will vary and operators shall be trained on types of waste that are generated, stored, and/or characterized at that particular site.

Visual examination personnel shall be requalified once every two years.

The Level 1 visual examination training program includes:

<u>Formal Training</u>

- Project Requirements
- State and Federal Regulations
- Batch Data Report Forms
- Waste Stream-Specific Instruction (e.g., waste generating processes, typical packaging configurations, waste material parameters)

On-the-Job Training

- System Operation (equipment and procedures used by Level 1 visual examination personnel)
- Identification of Packaging Configurations
- Identification of Waste Material Parameters/Waste Matrix Codes
- Identification of liquid in excess of the limits in the TSDF-WAC and compressed gases
- Verification of waste stream description

1

COURSE: Visual Examination (Level 2)

TYPE: Classroom/OJT

OBJECTIVES: Upon completion of this course, the student will be able to perform visual examination or a review of visual examination records in a safe manner and will be able to confirm whether waste contains ignitable, corrosive, or reactive waste.

Successfully pass a comprehensive exam based upon training enabling objectives. The comprehensive exam will address the visual examination operation, documentation, and procedural elements stipulated in this WAP.

Perform practical capability demonstration in the presence of appointed site Permittee visual examination subject matter expert.

REFRESHER: Biennially

COURSE DESCRIPTION

Level 2 visual examination operators shall be instructed in the specific waste generating processes, typical packaging configurations, and waste material parameters expected to be found in each Waste Matrix Code in the waste stream being confirmed using visual examination.

The OJT and apprenticeship shall be conducted by an operator experienced and qualified in visual examination prior to qualification of the candidate. The training shall be site waste stream specific to include the various waste configurations being confirmed. For example, the particular physical forms and packaging configurations at each site will vary so operators shall be trained on types of waste that are generated, stored, and/or characterized at that particular site.

Visual examination personnel shall be requalified once every two years.

The Level 2 visual examination training program includes:

<u>Formal Training</u>

- Project Requirements
- State and Federal Regulations
- Batch Data Report Forms
- Application Techniques
- Waste Stream-Specific Instruction (e.g., specific waste generating processes, typical packaging configurations, waste material parameters)

On-the-Job Training

- Identification of Packaging Configurations
- Identification of Waste Material Parameters/Waste Matrix Code
- Identification of liquid in excess of the TSDF-WAC limits and compressed gases
- Verification of waste stream description

(This page intentionally blank)

Qualification Cards

(This page intentionally blank)

1

QUALIFICATION CARD: CH Waste Handling Technician (WH-01A, WH-01B)

CH Waste Handling Engineer (WH-02)

DURATION: Nine to twelve months

CLASSROOM TRAINING: Various classroom courses are utilized to provide operators the requisite training as part of the qualification process. The candidate must satisfactorily complete the classroom training courses prior to completion of the qualification card.

SCOPE: The CH Waste Handling Technician Qualification Card (WH-01A Backfill Technician, and Emplacement Technician, and WH-01B Waste Handling Technician) and CH Waste Handling Engineer Qualification Card (WH-02 Waste Handling Operations Qualification Card Guide Book [WH-GUIDE-1]).

REFERENCES: CH Waste Handling Technician Qualification Card (WH-01)
CH Waste Handling Engineer Qualification Card (WH-02)
Waste Handling Operations Qualification Card Guide Book (WH-GUIDE-1)

QUALIFICATION CARD DESCRIPTION (by category)

1. Equipment Knowledge Requirements

Demonstrate knowledge of the following for the various pieces of CH waste handling equipment and systems:

- General principle of equipment operation
- Understanding of alarms, indications, and readings
- Proper response to abnormal equipment conditions
- Precautions, administrative requirements, and technical specification requirements
- Basic safety requirements for equipment operation

2. Equipment Operation Practical Requirements

Demonstrate competency in conducting CH waste handling equipment and system functional and operational inspections.

Demonstrate competency in standard operation of CH waste handling equipment and systems.

3. Integrated Process Knowledge Requirements

Demonstrate knowledge of the following for the various integrated support functions.

- Administrative activities for equipment/system isolation, modification and control
- Management of site derived waste
- Proper response to abnormal facility conditions
- Container storage area inspections
- Facility support systems

4. Integrated Process Practical Requirements

Demonstrate competency in performing administrative duties for equipment/system isolation and control.

Demonstrate competency in management of site derived waste.

Demonstrate competency in performing container storage area inspections.

Walkdown the various facility support systems that affect waste handling.

1

QUALIFICATION CARD: RH Waste Handling Technician (RH-01A, RH-01B, RH-01C)

RH Waste Handling Engineer (RH-02)

DURATION: Nine to twelve months

CLASSROOM TRAINING: Various classroom courses are utilized to provide operators the requisite training as part of the qualification process. The candidate must satisfactorily complete the classroom training courses prior to completion of the qualification card

SCOPE: The RH Waste Handling Technician Qualification Card (RH-01A, RH-01B, RH-01C) and RH Waste Handling Engineer Qualification Card (RH-02).

REFERENCES: RH Waste Handling Technician Qualification Card
RH Waste Handling Engineer Qualification Card
Waste Handling Operations Qualification Card Guide Book

QUALIFICATION CARD DESCRIPTION (by category)

1. Equipment Knowledge Requirements

Demonstrate knowledge of the following for the various pieces of RH waste handling equipment and systems:

- General principle of equipment operation
- Understanding of alarms, indications, and readings
- Proper response to abnormal equipment conditions
- Precautions, administrative requirements, and technical specification requirements
- Basic safety requirements for equipment operation

2. Equipment Operation Practical Requirements

Demonstrate competency in conducting RH waste handling equipment and system functional and operational inspections.

Demonstrate competency in standard operation of RH waste handling equipment and systems.

3. Integrated Process Knowledge Requirements

Demonstrate knowledge of the following for the various integrated support functions.

- Administrative activities for equipment/system isolation, modification and control
- Management of site derived waste
- Proper response to abnormal facility conditions
- Container storage area inspections
- Facility support systems

4. Integrated Process Practical Requirements

Demonstrate competency in performing administrative duties for equipment/system isolation and control.

Demonstrate competency in management of site derived waste.

Demonstrate competency in performing container storage area inspections.

Walkdown the various facility support systems that affect waste handling.

1

QUALIFICATION CARD: Radiological Control Technician (RCT)

DURATION: ≈9 working months

CLASSROOM TRAINING: Various classroom courses are utilized to reinforce the training received as part of the qualification card. The candidate is required to complete

SCOPE:

REFERENCES: WP 12-5, WIPP Radiological Control Manual
WP 12-HP, WIPP OHP Procedures Manual
WP 12-RE, Rad Engineering Procedures Manual

QUALIFICATION CARD DESCRIPTION (by category)

1. Academics Training

There are 13 lessons associated with the core academics program and 15 lessons associated with the site academics program.

2. Practical Training

There are 33 job performance measures associated with the practical training element of the RCT qualification program covering the following areas:

Demonstrate generation of a Radiological Work Permit.

Demonstrate how a radiological area should be posted.

Demonstrate applicable emergency response to various events.

Demonstrate competency in operating various types of monitoring equipment.

3. Written Examination

This exam is administered after successful completion of academic lessons and practical lessons. Successful completion of the comprehensive written exam is necessary prior to participation in the oral examinations.

4. Oral Examination Board

The oral board consists of members of Radiation Safety, Operational Health Physics, Facility Operations, and Technical Training. This board will assess the candidate's response to normal and emergency situations encountered by a Radiation Control Technician

1

QUALIFICATION CARD: EST-01 Emergency Services Technician

DURATION: 2 Years

PREREQUISITIES: The candidate must be current in CPR and possess an EMT-I License.

CLASSROOM TRAINING: Additional classroom training courses are required prior to completion of this qualification card.

SCOPE: This qualification card must be completed by all candidates prior to standing a watch unsupervised. Qualification is a six month process. The individual may perform duties without direct supervision only for those evolutions and/or operations for which training has been completed.

All signatures must be made by an approved Subject Matter Expert. The signatures indicate that the trainee has demonstrated satisfactory knowledge and performance of the task(s) indicated.

REFERENCES: Emergency Services Technician Qualification Card Guide Book (EST-01G)
WIPP Emergency Management Program (WP 12-9)
Emergency Fire Pump (WP 04-FP2202)
Inspection and Testing of Sprinkler Systems
1. Wet Pipe Fire Sprinkler System Testing (WP 12-FP0025)
2. NFPA 13, Installation of Sprinkler Systems

QUALIFICATION CARD DESCRIPTION (by category)

1. Knowledge Requirements

Demonstrate basic knowledge of emergency management procedures and protocols such as:

- The purpose and types of dry chemicals utilized in large and portable dry chemical systems.
- Inspection and testing principles of sprinkler systems, buildings, pull boxes, and fire detection systems.
- The general operation and hazards of fixed halon systems.
- Principles and procedures for operation of various fire and rescue apparatus.
- Selection and use of personal protective equipment.
- Selection and use of hazardous material equipment and supplies for control and mitigation.

2. Practical Requirements

Demonstrate competency in the following areas:

- Use of fire suppression apparatus and equipment.
- Use of rescue apparatus and equipment.
- Inspection and testing techniques and completion of corresponding forms.
- Operation of ambulance and operation and application of all ambulance equipment and supplies.
- Application of all hazardous materials equipment and supplies for control and mitigation.

1

QUALIFICATION CARD: FPT-01 Fire Protection Technician

DURATION: 2 Years

PREREQUISITES: The candidate must be currently certified in CPR and possess an EMT-B License.

CLASSROOM TRAINING: Additional classroom training courses are required prior to completion of this qualification card.

SCOPE: This qualification card must be completed by all candidates prior to standing a watch unsupervised. Qualification is a six month process. The individual may perform duties without direct supervision only for those evolutions and/or operations for which training has been completed.

All signatures must be made by an approved Subject Matter Expert. The signatures indicate that the trainee has demonstrated satisfactory knowledge and performance of the task (s) indicated.

REFERENCES: Emergency Services Technician Qualification Card Guide Book (EST-01G)
WIPP Emergency Management Program (WP 12-9)

QUALIFICATION CARD DESCRIPTION (by category)

1. Knowledge Requirements

Demonstrate basic knowledge of emergency management procedures and protocols such as:

- The purpose and types of dry chemicals utilized in large and portable dry chemical systems.
- Inspection and testing principles of sprinkler systems, buildings, pull boxes, and fire detection systems.
- The general operation and hazards of fixed halon systems.
- Principles and procedures for operation of various fire and rescue apparatus.
- Selection and use of personal protective equipment.
- Selection and use of hazardous material equipment and supplies for control and mitigation.

2. Practical Requirements

Demonstrate competency in the following areas:

- Use of fire suppression apparatus and equipment.
- Use of rescue apparatus and equipment.
- Inspection and testing techniques and completion of corresponding forms.
- Operation of ambulance and operation and application of all ambulance equipment and supplies.
- Application of all hazardous materials equipment and supplies for control and mitigation.

1

QUALIFICATION CARD: Quality Assurance Inspector

DURATION: Six to nine months

CLASSROOM TRAINING: Various formal classroom courses are utilized to support the training received as part of the qualification card. The candidate is required to complete the classroom training courses, satisfactorily, prior to completion of the qualification card.

SCOPE: The Quality Assurance Qualification card establishes the minimum education, skill, training, knowledge, and experience requirements for Quality Assurance personnel who perform inspection activities.

REFERENCES: WP 13-1, Quality Assurance Program Description
QAI PD2-3, Qualification of Inspection Personnel

QUALIFICATION CARD DESCRIPTION (by category)

1. General Knowledge

Demonstrate knowledge of the minimum site specific procedures:

- ASME NQA-1
- Quality Assurance Program Description
- Safety Manual
- Hoisting and Rigging Procedures
- Work Authorization Procedures
- Document Control Procedures

2. On-the-Job Training

Perform at least 20 hours of the following activities while supervised by a qualified inspector:

- Receiving inspection
- Dimensional inspection
- Mechanical inspection
- Electrical inspection
- Civil inspection

3. Qualification Card

Perform the following tasks:

- Receipt inspection
- Conduct an inspection
- Hold/witness point inspection
- Issuance of a corrective action request
- Hold tag issuance
- Verification of corrective action
- Conduct a corrective action receipt inspection

1

QUALIFICATION CARD: Facility Operations Roving Watch

DURATION: Six to nine months

CLASSROOM TRAINING: Various classroom courses are utilized to reinforce the training received as part of the qualification card. The candidate is required to complete the classroom training courses, satisfactorily, prior to completion of the qualification card.

SCOPE: The Facility Operations Roving Watch qualification is the foundation for all of the Facility Operations qualifications. The qualifications developed utilizing the Facility Operations Roving Watch qualification are the Central Monitoring Room Operator Qualification (FO-CMRO-2) and the Facility Operations Shift Engineer Qualification (FO-FOSE-3) (for FSM). This qualification is used by all Facility Operations personnel qualifying. All of the requirements of the applicable qualifications must be completed by the candidate before operating any equipment or performing any operating evolutions without direct supervision of a qualified operator.

REFERENCES: Facility Operations Roving Watch Qualification Card (FO-RW-1)
WIPP Operations Watchstation Qualification Card Guide Book (FO-GUIDE-1)

QUALIFICATION CARD DESCRIPTION (by category)

1. System Knowledge

Demonstrate knowledge of the critical facility operating systems, such as:

- Theory of the system and equipment
- System design
- Differences in the various building systems around the facility
- Alarms and sequence of actions that follow alarms

The systems covered include:

- Facility electrical and backup electrical systems
- Heating, air conditioning, and ventilation systems
- Underground ventilation systems
- Domestic water and fire protection systems

2. System Operation Practical Evaluation

Demonstrate system startup/shutdown for the various facility systems according to procedures.

Demonstrate maintenance of applicable records pertaining to the operation of facility systems.

Demonstrate ability to conduct periodic required testing of facility systems.

Demonstrate competency to respond to alarms and emergency situations according to procedures.

3. Integrated Plant Knowledge

Discuss the site policies on equipment lockout/tagout.

Discuss the process of notifications and authorizations that is involved in making temporary plant modifications.

Discuss the site process for work authorization.

Discuss the role and responsibilities of Facility Operations on the site.

Discuss Conduct of Operations as it applies to Facility Operations.

4. Integrated Plant Practical Evaluation

Demonstrate the lockout/tagout process.

Prepare paperwork associated with a temporary plant modification.

Demonstrate ability to maintain the Facility Operations logs.

Demonstrate the actions that are taken in various facility emergencies.

Demonstrate ability to stand watch as RW during various shifts.

5. Oral Qualification Exam

This final portion of the qualification consists of an oral board exam conducted by board members who are knowledgeable in the qualification program areas.

1

QUALIFICATION CARD: Central Monitoring Room Operator

DURATION: Three to five months

CLASSROOM TRAINING: Various classroom courses are utilized to reinforce the training received as part of the qualification card. The candidate is required to complete the classroom training courses, satisfactorily, prior to completion of the qualification card.

SCOPE: The Facility Operations Central Monitoring Room Operator Qualification (FO-CMRO-2) in conjunction with the Roving Watch qualification make up the support for the Facility Operations Shift Engineer Qualification (FO-FOSE-3). This qualification is used by Facility Operations personnel qualifying as CMR operators or Facility Operations Shift Supervisors. All of the requirements of the applicable qualifications must be completed by the candidate prior to operating any equipment or performing any operating evolutions without direct supervision of a qualified operator. Qualification are valid for two years.

REFERENCES: Central Monitoring Room Operator Qualification Card (FO-CMR-2)
WIPP Operations Watchstation Qualification Card Guide Book (FO-GUIDE-1)

QUALIFICATION CARD DESCRIPTION (by category)

1. System Knowledge

Demonstrate knowledge of the following for the various systems in the Central Monitoring Room:

- Theory of the system and equipment
- System design
- Alarms and sequence of actions that follow the alarms

2. System Operation Practical Evaluation

Demonstrate competency in standard operation of the systems in the Central Monitoring Room including obtaining various pieces of information such as:

- System status
- Alarm Status
- Meteorological data

Demonstrate what actions are to take place in the event of an alarm.

Demonstrate storage of information and subsequent retrieval.

3. Integrated Plant Knowledge

State the actions that must be taken to remove a CMS point scan/alarm check.

Discuss the sequence of events that must occur during a facility emergency.

4. Integrated Plant Practical Evaluation

Demonstrate how the CMR log is maintained.

Demonstrate the sequence of events that are involved in CMS point scan/alarm check removal.

Demonstrate ability to stand watch as CMRO during different shifts.

Demonstrate the sequence of events involved in a facility emergency.

5. Oral Qualification Exam

This final portion of the qualification consists of an oral board exam conducted by board members who are knowledgeable in the qualification program areas.

1

QUALIFICATION CARD: Facility Operations Shift Supervisor

DURATION: Three to five months

CLASSROOM TRAINING: Various classroom courses are utilized to reinforce the training received as part of the qualification card. The candidate is required to complete the classroom training courses, satisfactorily, prior to completion of the qualification card

SCOPE: The Facility Operations Shift Engineer Qualification (FO-FOSE-3) is the final qualification developed from the Central Monitoring Room Operator Qualification and Roving Watch Qualification. This qualification is used by Facility Operations personnel, Facility Operations Engineer, and Facility Shift Manager. The candidate must be recommended by the Facility Operations Manager to perform this qualification. All of the requirements of the applicable qualifications must be completed by the candidate prior to operating any equipment or performing any operating evolutions without direct supervision of a qualified operator. Qualifications are valid for two years.

REFERENCES: Facility Operations Shift Engineer (FO-FOSE-3)
WIPP Operations Watchstation Qualification Card Guide Book (FO-GUIDE-1)

QUALIFICATION CARD DESCRIPTION (by category)

1. System Knowledge

Completed qualification through Central Monitoring Room Operator Qualification and Roving Watch Qualification

2. System Operation Practical Evaluation

Completed qualification through Central Monitoring Room Operator Qualification and Roving Watch Qualification

3. Integrated Plant Knowledge

Discuss the site work authorization process and the role of the FSM.

Discuss the use of operator aids.

Discuss the responsibilities of the FSM.

Discuss the use of shift instructions.

Discuss the role of the FSM in facility emergencies and the actions that are to be taken by the FSM.

Discuss the role of the Quality Assurance and Safety programs on the site.

Discuss the Contingency Plan and its implementation.

Discuss site regulatory compliance as it applies to hazardous waste and hazardous materials.

4. Integrated Plant Knowledge Evaluation

Complete the required documentation for a lockout/tagout.

Complete the proper documentation relating to temporary plant modifications.

Perform various work authorization actions.

Demonstrate a review of the Facility Operations logs.

Demonstrate the response required for various facility emergencies.

Demonstrate ability to stand watch as FSM during different shifts.

5. Oral Qualification Exam

This final portion of the qualification consists of an oral board exam conducted by board members who are knowledgeable in the qualification program areas.

1

QUALIFICATION CARD: WWIS Data Administrator

DURATION: Two years

CLASSROOM TRAINING: Various classroom courses are utilized to provide the WWIS Data Administrator with the knowledge and background on the WIPP waste operations. OJT connected with the everyday operation of the database will be provided by the WWIS SME. The candidate must satisfactorily complete the classroom training courses and the OJT prior to qualification.

SCOPE: The WWIS Qualification Card provides the minimum knowledge and competency requirements for qualification. The requirements of the qualification must be completed to the satisfaction of the current WWIS SME prior to the candidate performing any of the WWIS data functions without direct supervision by a qualified WWIS DA.

REFERENCES: WWIS Data Administrator Qualification Card

QUALIFICATION CARD DESCRIPTION (by category)

1. Equipment Knowledge Requirements

Demonstrate knowledge of the following WWIS hardware and software systems:

- General computer operation principles and communication terminal techniques
- IBM PC and Internet techniques
- Bar Code Reader System operation

2. Equipment Operation Practical

- Obtain and maintain local and Internet IDs
- Access WWIS and produce reports
- Demonstrate operation of bar code reader interface to WWIS

3. Integrated Process Knowledge Requirements

Demonstrate knowledge of the following project document data requirements:

- WIPP Waste Acceptance Criteria
- WIPP Quality Assurance Program Plan
- Waste Analysis Plan

Demonstrate knowledge of the following WWIS Specific documentation:

- WWIS Software Requirements Specification
- WWIS Software Configuration Management Plan
- WWIS Software Quality Assurance Plan
- WWIS Software Design Description

4. Integrated Process Practical Requirements

Demonstrate competency in performing the administrative duties of the WWIS DA

Demonstrate competency in accessing the local area network (LAN) and the Internet.

Demonstrate the WIPP data interface to the WWIS via a walkdown of the receipt and emplacement operations that provide data to the database.

1

QUALIFICATION CARD: Radioactive Transportation (TE-01)

Federal Motor Carrier Safety Regulations (TE-02)

Hazardous Materials (TE-03)

Hazardous Waste Shipments by Public Highway (TE-05)

DURATION: Six to twelve months

CLASSROOM TRAINING: Various classroom courses are utilized to provide candidates the requisite training as part of the qualification process. The candidate must satisfactorily complete the classroom training courses listed on the individual qualification card as a prerequisite to beginning that process.

SCOPE: The Transportation Engineer qualification cards (TE-01 through TE-05) provide the minimum knowledge and competency requirements for qualification. The requirements of the individual qualification cards must be completed by the candidate prior to performing those duties without direct supervision.

REFERENCES: Radioactive Transportation (TE-01)
Federal Motor Carrier Safety Regulations (TE-02)
Hazardous Materials (TE-03)
Hazardous Waste Shipments by Public Highway (TE-05)

QUALIFICATION CARD DESCRIPTION (by category)

1. Knowledge Requirements

Demonstrate knowledge of the following regulatory arenas:

- Radioactive Material Transportation
- Federal Motor Carrier Safety Regulations
- Hazardous Materials
- Hazardous Waste Shipments by Public Highway

2. Practical Requirements

Demonstrate competency in performing the following for a given shipment:

- Determine the proper shipping name
- Determine the proper labeling and placement requirements
- Determine the proper application and marking requirements
- Prepare the proper shipping documents (i.e., Hazardous Waste Manifest, Bill of Lading, LDR notification form, etc.)

1

QUALIFICATION CARD: Sampling Team (ST-01)

DURATION: 1 month

CLASSROOM TRAINING: HWW-101 - Hazardous Waste Worker/Hazardous Waste Responder

SCOPE: This qualification card must be completed by all candidates prior to performing sampling tasks without the direct supervision of a qualified person. This qualification ensures that the sampler will collect samples in a way that will protect the sampler and the integrity of the sample collected.

REFERENCES: WIPP Sampling Team Qualification Guide ST-01G
WP 02-EC.05 Quality Assurance Project Plan for WIPP Site Effluent and Hazardous Materials Sampling
WP 02-EC.06 WIPP Site Effluent and Hazardous Materials Sampling Plan

QUALIFICATION CARD DESCRIPTION (by category)

1. Knowledge Requirements

Demonstrate basic knowledge of hazardous waste sampling protocol such as:

- Preventing cross-contamination of samples and equipment
- Importance of the a chain-of-custody
- Purpose of the field logbook and documentation
- Labeling and sealing procedures
- Methods of obtaining various sample types (i.e. TCLP organics, volatile organic compounds, TCLP metals)

2. Safety Requirements

Demonstrate knowledge of the safety requirements for sampling activities such as:

- Level of personal protective equipment (PPE) needed for various sampling situations
- Actions to take when encountering damaged or bulging containers
- Importance of the “Buddy System”

3. Practical Requirements

- Correct and safe use of sampling equipment
- Collection of a given sample preventing cross-contamination
- Labeling and sealing sampling containers
- Completion of the Chain-of-Custody form

1

QUALIFICATION CARD: Sampling Team Assistant (STA-01)

DURATION: 1 month

PREREQUISITES: HWW-101 - Hazardous Waste Worker/Hazardous Waste Responder

SCOPE: This qualification card must be completed by all candidates prior to performing sampling tasks without the direct supervision of a qualified person. This qualification ensures that the sampler will collect samples in a way that will protect the sampler and the integrity of the sample collected.

REFERENCES: WIPP Sampling Team Qualification Guide ST-01G
WP 02-EC.05 Quality Assurance Project Plan for WIPP Site Effluent and Hazardous Materials Sampling
WP 02-EC.06 WIPP Site Effluent and Hazardous Materials Sampling Plan

QUALIFICATION CARD DESCRIPTION (by category)

1. Knowledge Requirements

Demonstrate basic knowledge of hazardous waste sampling protocol such as:

- Preventing cross-contamination of samples and equipment
- Importance of the chain-of-custody
- Purpose of the field logbook and documentation
- Labeling and sealing procedures
- Methods of obtaining various sample types (i.e., TCLP organics, volatile organic compounds, TCLP metals)

2. Safety Requirements

Demonstrate knowledge of the safety requirements for sampling activities such as:

- Level of personal protective equipment (PPE) needed for various sampling situations
- Actions to take when encountering damaged or bulging containers
- Importance of the “Buddy System”

3. Practical Requirements

- Correct and safe use of sampling equipment
- Collection of a given sample preventing cross-contamination
- Labeling and sealing sampling containers
- Completion of the Chain-of-Custody form

1

QUALIFICATION CARD: Waste Handling Hoist Equipment Operator

DURATION: Approximately 12 to 15 months

SCOPE: The Waste Handling Hoist Equipment Operator Qualification (M-30) prepares the candidate to be a qualified man-hoist operator. All of the requirements for the applicable qualification must be completed prior to operating the Waste Handling Hoist unless under the direct supervision of a qualified operator.

REFERENCES: Waste Handling Hoist Equipment Operator Qualification Card Guide (M-30G)
Waste Handling Shaft Operation Procedure

QUALIFICATION CARD DESCRIPTION (by category)

1. Equipment Knowledge

Demonstrate knowledge of the following systems associated with the Waste Hoist:

- Major components of the Waste Hoist in the headframe and collar areas
- Major components of the Waste Hoist electrical systems
- Be able to describe the correct operations of all Waste Hoist systems and their interrelationships

2. Equipment Safety

Demonstrate knowledge of all safety systems associated with the Waste Hoist and how their functions affect hoist operation.

Describe the correct response of the operator when safety features are actuated.

3. Equipment Practical

Perform normal startup and shutdown of all Waste Hoist systems.

Perform normal hoisting operations for material and personnel in all modes of operation.

4. Classroom Training

Receive formal training in electrical safety.

5. Required Reading

Read the appropriate related procedures for waste hoist operation.

1

QUALIFICATION CARD: Waste Handling Shaft Tender Operator

DURATION: Approximately 7 months

SCOPE: The Waste Handling Shaft Tender Operator Qualification (M-31) prepares the candidate to operate controls and systems located at both the collar area (surface) and the station area (underground) at the Waste Shaft. All the requirements for this qualification must be completed prior to operation of Waste Shaft systems unless under the direct supervision of a qualified operator.

REFERENCES: Waste Handling Shaft Tender Qualification Guide (M-31G)
Waste Handling Shaft Operation Procedure

QUALIFICATION CARD DESCRIPTION (by category)

1. Equipment Knowledge

Demonstrate knowledge of the following Waste Shaft equipment at the collar and station:

- Waste Shaft controls
- Communication systems
- Conveyance control panels
- Cage and its capacity

2. Equipment Safety

Demonstrate knowledge of all safety systems and devices associated with the Waste Hoist.

Describe the position responsibilities with regard to shaft safety and who to contact during abnormal conditions

3. Personnel Safety

Demonstrate knowledge of the requirements for all personnel who wish to enter the underground via the Waste Shaft.

Demonstrate knowledge of actions required during all work in and around the Waste Shaft or surrounding areas.

4. Equipment Maintenance

Describe the maintenance and inspection duties of both the collar and station tender.

5. Equipment Practical

Perform pre-shift inspections of the collar and station areas.

Perform all record keeping duties of the shaft tender.

Demonstrate proper operation of the Local Control Stations, Pivot Rail System, and Bell Systems.