

ATTACHMENT H2

TRAINING COURSE AND QUALIFICATION CARD OUTLINES

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Course Outlines

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1 **COURSE:** GET-19X/GET-20X - General Employee Training

2 **DURATION:** . 16 Hours

3 **PREREQUISITES:** None

4 **SCOPE:**

5 **TYPE:** Classroom

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

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

11 **REFRESHER:** GET-19XA/GET-20XA annually

12 **COURSE DESCRIPTION** (by module)

13 1. Site Overview & WIPP Description
14 . 1 hour

- a. Mission of DOE and CBFO
- b. Relationship of WIPP organizations
- c. Surface structures
- d. WIPP shafts
- e. Underground area

18 2. Emergency Preparedness
19 (includes Occurrence Reporting)
20 . 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

32 3. General Safety
33 . 1 hour

- a. Personal Protective Equipment
- b. Requirements for PPE
- c. Warning Tags

- d. WIPP safety hazards
- e. Medical assistance

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- 4 4. Computer Security
5 . 1 hour
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- 11 5. Fire Protection
12 . 1 hour
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- 19 6. RCRA & Storm Water Management
20 . 2 hours
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- 33 8. Work Policies and Procedures
34 . 1 hour
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- f. Actions to take for injuries
g. Reporting injuries/accidents
h. Employee concerns
- 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
- 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
- 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
- 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

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9. Electrical Safety
. 1 hour

- j. Correcting errors on QA Records
- k. Configuration Management and affected departments
- 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 GFI's
- 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

1 e. WIPP Exposure Control Plan

2 13. Ergonomics
3 . 2 hours

- 4 a. Cumulative Trauma Disorder
5 b. Risk factors for CTD
6 c. Prevention of CTD
7 d. Recognition of CTD
8 e. Steps to take when CTD develops

9 14. Security
10 . 1 hour

- 11 a. Security Mission
12 b. Def. of Security Officer
13 c. Security Officer Tasks
14 d. Access and Property Control at
15 WIPP
16 e. Badge accountability
17 f. Property Pass system
18 g. Physical security
19 h. Telephone threat list
20 i. Employee responsibilities during
21 demonstration
22 j. Fitness for duty
23 k. Computer security
24 l. Parking requirements

25 15. General Employee Radiological Training (GERT)
26 . 1 hour

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

29 Sources of Radiation
30 Non-ionizing and Ionizing Radiation
31 Risk in Perspective
32 ALARA Concept
33 Radiological Controls
34 Monitoring/Dosimetry
35 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 - General Employee Training Refresher
- 2 **DURATION:** Self-paced Course
- 3 **PREREQUISITES:** None
- 4 **SCOPE:**
- 5 **TYPE:** Self-paced Module
- 6 **OBJECTIVES:** Objectives are stated at the beginning of each module, including security,
7 radiological basics, general safety, hazard communications, bloodborne
8 pathogens, hearing protection, and OSHA/RCRA.
- 9 Mastery of the terminal objective will be demonstrated by scoring
10 80 percent or higher on the module examination.
- 11 **REFRESHER:** Annually

12 **COURSE DESCRIPTION (by module)**

- 13 1. Introduction a. Self Paced Course
14 b. Information about WIPP
15 organizations
16 c. Appendix Information
17 1. Storm Water Management
18 2. WIPP Land Withdrawal Act
19 3. DOE Mission
20 d. Exam Guidelines
- 21 2. General Security a. Prohibited Articles
22 b. Primary responding agencies
23 c. Wearing your badge
24 d. Escort Responsibility
25 e. Number of visitors an employee may
26 escort
27 f. When to turn off your computer
28 g. Personal Property Passes
- 29 3. Computer Security a. Point of contact
30 b. WIPP policies and procedures for:
31 1. Personally owned software
32 2. Computer games
33 3. Passwords/password
34 protection
35 c. Computer virus prevention

- 1 4. Fitness for Duty
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- 4 5. RCRA
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- 6 6. Storm Water Management
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- 9 7. Bloodborne Pathogens
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- 14 8. Hazard Communications
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- 22 9. Ergonomics
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- 25 10. Personal Protective Equipment
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- 31 11. General Safety
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- a. Reasons for the Fitness for Duty Program
b. General Employee Responsibilities
- a. Types of waste disposed
b. Waste Identification
- a. Application of Storm Water Management policy in relation to the general employee
- a. Transmission Identification of Bloodborne Pathogens
b. Prevention of Hepatitis B and Human Immunodeficiency Virus
c. Actions to take if exposed
- 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
- a. Identification of CTD
b. Ways to prevent CTD
c. Required actions
- a. Requirements for head protection
b. Requirements for hearing conservation
c. Requirements for face/eye protection
d. Requirements for foot protection
- 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

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12. Conduct of Operations

- i. When to use the sign-out board
- 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

2 **DURATION:** . 24 hours

3 **PREREQUISITES:** None

4 **SCOPE:**

5 **REFRESHER:** HWW-102 Annually

6 **COURSE DESCRIPTION** (by module)

7 1. Course and Regulatory Overview
8 . 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

15 2. Hazard Communications
16 . 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.

30 3. Principles of Toxicology
31 . 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

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10 4. Hazards
11 . 3 hours

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30 5. Personal Protective Equipment
31 . 3 hours

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- e. Exposure limits including Threshold Limit Value (TLV), Permissible Exposure Limit (PEL), Lethal Dose 50% (LD₅₀), Lethal Concentration 50%(LC₅₀)
- f. Effects of temperature extremes on the human body including signs and symptom heat stress and cold stress
- g. Effects of ionizing radiation

- 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

- 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

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6. Satellite Accumulation Areas
. 2 hours

7. Decontamination
. 2 hours

- 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.
-
- 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
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- 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

2 **DURATION:** 8 hours

3 **PREREQUISITES:** HWW-101

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

10 **TYPE:** Classroom and Practical

11 **COURSE DESCRIPTION** (by lesson)

- 12 1. Material or Waste Information a. Definition of TRU mixed waste
13 . 2 hours b. Emergency actions in the event of a
14 spill or leaking or punctured
15 container of TRU mixed waste
16 c. This module describes the
17 information found in the supplier
18 information section of a Material
19 Safety Data Sheet (MSDS)
20 d. This information is used in the event
21 the user of the material needs more
22 information than what is included in
23 the particular MSDS
24 e. Information
25 1. This module describes the
26 product's individual
27 ingredients, relative
28 concentration, and the
29 exposure limit for each
30 ingredient
31 f. Physical/Chemical Data
32 1. This module describes the
33 chemical and physical
34 properties of the material
35 including; boiling point,
36 specific gravity, melting point,
37 vapor pressure, vapor density,
38 evaporation rate, solubility, pH,
39 and volatility
- 40 2. Hazard Data a. This module describes the fire and

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- 29 3. Safety
- 30 . 2 hours
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- 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
- 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,

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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
- 2 **DURATION:** 20 hours
- 3 **PREREQUISITES:** GET-19X/GET-20X
4 Medical Physical
5 SAF 630/631- Respiratory Protection
6 HWW 101 - Hazardous Waste Worker
- 7 **SCOPE:** The instructor will present updated information needed for personnel who
8 respond to hazardous material and/or hazardous waste emergencies at
9 the WIPP site.
- 10 **TYPE:** Classroom and Field Exam
- 11 **OBJECTIVE:** Upon completion of this course, the student will be able to respond to
12 hazardous materials emergencies at the WIPP site
- 13 Mastery of the terminal objective will be demonstrated by scoring 80
14 percent or higher on the post course examination, satisfactory
15 performance on the job performance measure for donning and doffing
16 Personal Protective Equipment, and participate as a team in the final
17 practical.
- 18 **REFRESHER:** HWR-101A Annually

19 **COURSE DESCRIPTION**

- 20 1. Regulatory Requirements a. 29 CFR 1910.120
21 . 1 hour
- 22 2. Evaluation of Incident a. Physical data
23 . 3 hours 1. color
24 A. (Types of Information) 2. odor
25 3. sound
26 b. Cognitive
27 c. Technical
- 28 B. Dispatch and Initial Response Phase a. Primary focus information
29 b. CMR information
30 c. During a response
- 31 C. Product Information a. Product identification
32 b. Primary and secondary hazards
- 33 D. Incident Elements a. Spill
34 b. Leak
35 c. Fire

- 1 E. Incident Priorities
- 2 3. Response Operations
- 3 . 1 hour
- 4 A. Size-up, Strategy, and Tactics
- 5 a. Size-up
- 6 1. Monitoring atmospheric
- 7 conditions near the release
- 8 a. Weather conditions
- 9 b. Organic vapors, gases,
- 10 particulates
- 11 c. Oxygen deficiency
- 12 d. Specific materials
- 13 e. Combustible gases
- 14 f. Inorganic vapors, gases,
- 15 particulates
- 16 g. Radiation
- 17 2. Visual observations
- 18 3. Unusual odors
- 19 4. Off-site samples
- 20 5. Entry team procedures
- 21 a. Monitoring on-site
- 22 ambient air
- 23 b. Types of containers and
- 24 impoundments
- 25 c. Physical condition of
- 26 material
- 27 d. Leaks or discharges
- 28 e. Labels and markings
- 29 6. Additional considerations
- 30 a. Type, condition, and
- 31 behavior of container
- 32 b. Resources and control
- 33 measures
- 34 7. Summary of size-up
- 35 b. Strategy and tactics
- 36 1. Definitions
- 37 2. Strategy
- 38 3. Tactics
- 39 4. Rescue
- 40 5. Prevent container failure
- 41 6. Containment
- 42 7. Confinement
- 43 8. Remove ignition sources
- 44 9. Extinguish fires
- 45 10. Tactical withdrawal
- 46 B. Incident Command System and
Mitigation Plan at the WIPP
- a. Key elements required
- b. Key personnel and functions

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- 12 4. Safety
- 13 . 5 hours
- 14 A. Responder Protection
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- 22 B. Personal Protective Equipment
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- 32 C. Donning and Doffing Level A PPE
- 33 D. Job Performance Measures
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- 35 E. Decontamination
- 36 F. Emergency Medical Services
- 37 5. Table-top Drill
- 38 . 2 hours
- 39 6. Course Review
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
- a. Pre-entry evaluation
- b. Deny entry
- c. Hydration
- d. Pre-entry briefing
- e. Post-exit evaluation
- f. Support location
- g. Environmental temperature monitoring
- 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
- a. Students will Don and Doff Level A PPE with a partner

1 7. Written Examination

2 8. Practical
3 . 5 hours

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

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

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

2 **DURATION:** . 8 hours

3 **PREREQUISITES:** HWR-101

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

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

10 **REFRESHER:** Annually

11 **COURSE DESCRIPTION**

12 1. Review of HWR-101
13 . 2 hours

14 2. Changes in Regulations, procedures, and polices
15 . 2 hours

16 3. Lessons Learned
17 . 2 hours

18 4. Conclusion and Exam
19 . 2 hours

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

1 **COURSE:** HWS-101 - Hazardous Waste Worker Supervisor

2 **DURATION:** . 8 hours

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

9 **TYPE:** Classroom

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

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

15 **REFRESHER:** HWS 101A annually

16 **COURSE DESCRIPTION** (by lesson)

- 17 1. Liability and Responsibility
18 . 3 hours
- 19 a. General requirements
 - 20 b. Definitions and key liability concepts
 - 21 c. Mental element in criminal litigation
 - 22 d. Typical litigation chronology
 - 23 e. Civil and criminal penalties under
24 OSHA
 - 25 f. Criminal penalties under
26 environmental laws
 - 27 g. Federal sentencing guidelines
 - 28 h. Mitigation credit under Federal
29 Sentencing Guidelines
 - 30 i. Who will be defendants
 - 31 1. Direct involvement
 - 32 2. Direct supervisory involvement
 - 33 3. Indirect involvement and
34 Responsible Corporate Officer
35 doctrine
 - 36 j. Representation
 - 37 k. Indemnification
 - 38 l. Scope of employment
 - 39 m. Types of criminal cases being
40 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

- 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. Exposure limits
- b. Conversion and comparison of PPM

- a. Spill response plan

- a. Zoning

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8 2. Health and Safety Program
9 . 3 hours

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22 A. Industrial Hygiene

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24 B. Spill Containment
25 (Emergency Response)

26 C. Site Control

27 D. Decontamination

28 E. Reporting Requirements

29 3. Conclusion . 1 hour

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

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

2 **DURATION:** . 8 Hours

3 **PREREQUISITES:** HWS-101

4 **TYPE:** Classroom

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

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

10 **REFRESHER:** Annually

11 **COURSE DESCRIPTION** (by lesson)

- 12 1. Review of HWS-101 a. Liability and Responsibility
13 . 2 hours b. Health and Safety Program
- 14 2. Changes in regulations, procedures, policies
15 . 2 hours
- 16 3. Lessons Learned
17 . 2 hours
- 18 4. Conclusion and Exam
19 . 1 hour

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

1 **COURSE:** SAF-630/631 - Respiratory Protection

2 **DURATION:** . 8 hours

3 **PREREQUISITES:** Medical physical

4 **TYPE:** Classroom and Practical

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

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

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

14 **COURSE DESCRIPTION** (by lesson)

15 1. Introduction

16 . 2 hours

17 A. Basic Requirements

18 a. Regulations

19 b. DOE Orders

20 c. Industry Standards

21 d. WIPP Procedures

22 1. Physical exam

23 2. Pulmonary test

24 3. Training

25 4. Fit Testing

26 5. Identification of potential
27 respirator activities

28 6. Selection of Respirators

29 7. Respirator usage, storage and
 sanitation

- 1 B. Nature, Extent, and Effects of
2 Respiratory Hazards and the
3 Need for Protection
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 - 12 C. Engineering and Administrative
13 Controls
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 - 16 2. Use of Respirators at WIPP
17 . 2 hours
 - 18 A. Selection of Respirators
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 - 27 B. Air Purifying Respirators
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 - 33 C. Atmosphere Supplying Respirators
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 - 35 D. Respirator Cleaning/Storage
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- 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
 - a. Hazard Control
 - 1. Engineering Controls
 - 2. Administrative Controls
 - b. ALARA
 - 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
 - a. Operation
 - b. Limitations/Capabilities
 - 1. Particulate Air Filters
 - 2. Chemical Cartridge Respirators
 - a. Operation
 - b. Limitations/Capabilities
 - a. Cleaning Frequency
 - b. Maintenance
 - c. Storage

- 1 E. Respiratory Emergencies
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- 8 3. Practical Session
- 9 . 2 hours
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- 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
- 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

35 **All time are approximate and do not reflect time spent on additional topics that arise due**

36 **to class participation, student breaks, class size, and/or practical exercises. (i.e. Job**

37 **Performance Measures)**

1 **COURSE:** SAF-515 - Confined Space

2 **DURATION:** . 12 hours

3 **PREREQUISITES:** GET-19X/GET-20X initial training
4 Medical physical
5 SAF-630/631 Respiratory Protection
6 Current OPS-08 Qual Card

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

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

14 **TYPE:** Classroom and practical

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

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

22 **REFRESHER:** SAF-515A Annually

1 **COURSE:** SAF-515A - Confined Space

2 **DURATION:** 4 Hours

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

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

10 **TYPE:** Classroom

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

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

15 **REFRESHER:** Annually

- 1 **COURSE:** RAD-101 - Radiological Worker I
- 2 **DURATION:** . 16 hours
- 3 **PREREQUISITES:** None
- 4 **SCOPE:** The instructor will present radiological theory and practical information
5 necessary to allow unescorted entry into a controlled area, radioactive
6 materials area, radiological buffer area, and radiation area as required by
7 the WIPP Radiation Safety Manual.
- 8 **TYPE:** Classroom And Practical
- 9 **OBJECTIVES:** Upon completion of this course, the student will have the knowledge to
10 work safely in areas controlled for radiological purposes.
- 11 Mastery of the terminal objective will be demonstrated by scoring 80
12 percent or higher on the course examination and satisfactory
13 performance on the practical examination.
- 14 Completion of the course meets the training requirements necessary for
15 Radiological Worker -I (RWT-I).
- 16 **REFRESHER:** Retraining every two years with an alternate year refresher.

17 **COURSE DESCRIPTION** (by lesson)

- 18 1. Radiological Fundamentals a. Introduction
19 . 2 hours 1. DOE Safety Policy
20 2. Course Overview
21 3. Radiological Worker (core
22 academics)
23 a. Radiological Worker II
24 (RW II) training
25 b. Course outline
26 c. Successful completion
27 b. Atomic Structure
28 1. Basic Units of Matter
29 a. Protons
30 b. Neutrons
31 c. Electrons
32 2. Stable and Unstable atoms
33 3. Charge of the atom

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- 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"

- 1 2. Biological Effects
2 . 1 hour
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- 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

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3. Radiation Limits
. 1 hour

4. ALARA Program
. 1 hour

- f. Risks in Perspective
 - 1. Risk from exposures to ionizing radiation
 - 2. Comparison of risks
- g. Summary
 - 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
 - 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

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5. Personnel Monitoring Programs
. 1 hour

6. Radiological Postings and Controls
. 2 hours

- 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
 - 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
- a. Radiological Work Permits
 - 1. Use
 - 2. Types

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- 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 RBA's
 - 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

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6. Radiological Emergencies
1 hour

- 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
 - 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

- 1 7. High/very High Radiation Area Training
 - 2 . 1 hour
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- 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
- 2 **DURATION:** . 8 hours
- 3 **PREREQUISITES:** None
- 4 **SCOPE:** The instructor will present an intensive course intended for the
5 radiological workers whose job assignments involve unescorted entry to
6 high and very high radiation areas, contamination areas, high
7 contamination areas, and airborne activity areas.
- 8 **TYPE:** Classroom And Practical
- 9 **OBJECTIVES:** Demonstrate the ability to work safely in radiologically controlled areas,
10 use ALARA techniques in accordance with WIPP radiation protection
11 procedures
- 12 Mastery of the terminal objective will be demonstrated by scoring 80
13 percent or higher on the course examination and satisfactory
14 performance on the practical examination
- 15 **REFRESHER:** Retraining every two years with an alternate year refresher

16 **COURSE DESCRIPTION** (by lesson)

- 17 1. Radioactive Contamination a. Plutonium
18 . 3 hours b. Comparison of ionizing radiation
19 1. Ionizing radiation and
20 radioactive contamination
21 2. Radioactive contamination
22 3. Radiation is energy,
23 contamination is material
24 c. Types of contamination
25 d. Sources of radioactive
26 contamination
27 1. Sources
28 2. Indicators of possible area
29 contamination
30 3. Employee response to a spill
31 e. Contamination control methods
32 1. Preventable methods
33 2. Engineering control methods
34 3. Personal protective measures
35 a. Protective clothing
36 f. Contamination monitoring equipment
37 1. Purpose
38 2. Types and uses
39 3. Frisking

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- 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
- 2 **DURATION:** . 4 hours
- 3 **PREREQUISITES:** Manager Approval
- 4 **TYPE:** Classroom
- 5 **SCOPE:** The instructor will provide the training skills and knowledge necessary to
6 perform the role of subject matter expert (SME)/on-the-job trainer (OJT).
- 7 **OBJECTIVE:** Upon completion of this course the student will be able to perform the
8 instructional duties of a Level I Instructor (SME/OJT trainer) In
9 compliance with WIPP training policies.
- 10 Mastery of the terminal objective will be demonstrated by scoring 80
11 percent or higher on the course examination.
- 12 **REFRESHER:** Every Two Years

13 **COURSE DESCRIPTION (by lesson)**

- 14 1. Requirements for Qualification a. Qualification card
15 . 5 hour b. Designation letter to training
16 c. Training course
17 d. SME Qualification Board
18 e. Arranging the SME Board
19 f. Conduct of the Board
20 g. Maintaining qualification
21 h. Lapses in qualification
- 22 2. Role of the Level I Instructor a. Conduct formal OJT
23 . 1 hour b. Develop/revise qualification cards
24 c. Maintaining files related to area of
25 expertise
26 d. Limitations of Level I Instructors

- 1 3. On-The-Job (OJT) Training
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- 14 4. Qualification Cards
15 . 1 hour
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- 20 5. Qualification Guide
21 . .5
- 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
- a. Purpose
b. Elements
c. Writing competency statements
d. Selecting competency statements
for requalification
e. Reviewing qualification cards

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

- 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

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4. Overview of PBT/TAP
1 hour

- 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
 - 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

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5. Methods of Instruction
. 1 hour

6. Development of Learning Objectives
. 1 hour

- b. Process/products
- f. DOE Order
 - 1. DOE Order 5480.18
- h. Summary
 - 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
 - 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

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7. Methods of Testing
2 hours

- g. Information source for enabling objectives
- h. Exercise
 - 1. Terminal objective
 - 2. Enabling objective
- i. Summary
 - 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

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9 8. Developing Lesson Plans
10 . 2 hours

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35 9. Development of Instructional Aids
36 . 2 hours

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- 2. Required formats
- 3. Approval
- g. Control of examinations
 - 1. Examination preparation
 - 2. Administering the examination
 - 3. Grading examination
- h. Examination failure
- i. Summary
 - 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
 - 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

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28 10. Use of Presentation and Facilitation Skills
29 . 2 hours

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43 11. Effective Questioning Techniques
44 . 2 hours

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- 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
- 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
- a. Motivator
 - 1. Why trainers do not ask questions
 - a. Control

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12. Handling Behavioral Problems
1 hour

- 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

- 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

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- 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
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- 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
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- 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

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- 2 15. Training Administration
- 3 . 1 hour
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- 23 16. Final Practical
- 24 . 6 hours
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- 26 17. Examinations
- . 2 hours
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- 28 18. Work Time
- . 8 hours
- g. Summary
- 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

29 **All times are approximate and do not reflect additional time spent on topics that arise**

30 **from class participation, student breaks, class size, and/or practical exercises. (i.e. Job**

31 **Performance Measures)**

- 1 **COURSE:** MED-101 - First Aid and CPR
- 2 **DURATION:** 12 hours
- 3 **PREREQUISITES:** None
- 4 **SCOPE:** The instructor will provide CPR training including one-rescuer CPR, the
5 Heimlich maneuver, and first aid techniques.
- 6 **TYPE:** Classroom and CPR Practical
- 7 **OBJECTIVES:** Upon completion of this course, the student will be able to administer
8 basic first aid and one-rescuer CPR in accordance with the national
9 safety council. Identify heart disease factors, signs, and symptoms of a
10 heart attack and perform one-rescuer CPR and the Heimlich maneuver.
- 11 Mastery of the terminal objective will be demonstrated by scoring 80
12 percent or higher on the course examination and satisfactory
13 performance on the practical examination.
- 14 **REFRESHER:** MED 101A Annually

15 **COURSE DESCRIPTION** (by lesson)

- 16 1. Definitions and Legal Aspects a. Duty to act
17 . 1 hour b. Consent for treatment
18 c. Abandonment
19 d. Good Samaritan law
20 e. Confidentiality
- 21 2. Assessment a. Purpose
22 . 1 hour b. Systematic approach considerations
23 c. Parts
24 d. Scene assessment
25 e. Primary survey
26 f. Secondary survey
- 27 3. Cardiopulmonary Resuscitation (CPR) a. Anatomy of cardiovascular system
28 . 1 hour b. Physiology of the heart
29 c. Anatomy of the respiratory system
30 1. Upper airway
31 2. Lower airway
32 3. Alveoli
33 4. Pulmonary arteries, veins,
34 capillaries
35 d. Physiology of the respiratory system
36 e. Heart disease

1	Treatment of Various Conditions	
2	. 4 hours	
3	4. Shock	a. Hypovolemic shock
4		b. Fainting
5		c. Anaphylactic shock
6	5. Bleeding	a. Types
7		b. Control
8		c. Treatment
9		d. AIDS and HBV
10	6. Head Injury	a. General information
11		b. Scalp lacerations
12		c. Skull fractures
13		d. Spinal injuries
14		1. Treatment
15	7. Burns	a. Classifications
16		b. Causes
17		c. Treatment
18	9. Heat Related Injuries/Illnesses	a. Types
19		1. Heat cramps
20		a. Treatment
21		2. Heat exhaustion
22		a. Signs and symptoms
23		b. Treatment
24		3. Heat stroke
25		a. Signs and symptoms
26		b. Treatment
27	10. Bone and Joint Injuries	a. General information
28		b. Signs and symptoms
29		c. Treatment
30	11. Summary	
31	12. Written examination	
32	13. Practical	
33	. 3 hours	

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

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

- 1 **COURSE:** HMT-102 - Hazardous Materials and Waste Transportation
- 2 **DURATION:** . 16 Hours
- 3 **PREREQUISITES:** Manager approval and/or assignment to transportation duties in
4 accordance with 49 CFR
- 5 **SCOPE:** Instruction meeting 49 CFR 172 Subpart H provided in a modular format.
6 This course covers: awareness, the hazards material table, packaging,
7 marking, labeling, placarding, material separation and segregation,
8 special or unique transportation moves, safety, and site specific
9 transportation issues.
- 10 **TYPE:** Classroom lecture including exercises to enhance trainee learning and
11 retention
- 12 **OBJECTIVES:** Upon completion of the course, the trainee will be able to define, locate,
13 apply and maintain compliance with the DOT regulations involving the
14 transportation and/or offering for transportation of a hazardous material or
15 waste.
- 16 Mastery of this objective will be demonstrated by scoring a minimum of 80
17 percent on the course examinations using "approved course" reference
18 material.
- 19 **REFRESHER:** Biennially

20 **COURSE DESCRIPTION** (by lesson)

- 21 1. Awareness/familiarization a. Introduction
22 . 1 hour 1. Instructor
23 2. Lesson
24 3. Course content
25 4. Lesson objectives
26 b. Lesson materials
27 1. Department of Transportation
28 (DOT) Regulations
29 a. Brief history
30 b. Purpose
31 c. Scope
32 d. Terminology
33 e. Application of
34 regulations
35 2. Training programs
36 a. Module assignments
37 1. Basic modules
38 2. Additional modules
39 c. Training program objectives

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2. The Hazardous Materials Table
. 3 hours

- 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
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- 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

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3. Packaging
1.5 hours

- g. Summary
- h. Review
- i. Questions and answers

- 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

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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

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5. Labeling
1.5 hours

- e. Questions and answers
 - 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. Alternative labeling
 - 7. Mixed shipment in one package
 - a. Special requirements
 - 8. Combination package in one
 - a. Special requirements of outer package

6. Shipping Papers
1.5 hours

- c. Summary
- d. Review
- e. Questions and answers
 - 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

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7. Placarding
1.5 hours

- i. Summary
- j. Review
- k. Questions and answers

- 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

37 8. Separation and Segregation
38 1 hour
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- 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

- 1 9. Special and Unique Moves
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- 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
- 21 10. Safety
22 . 1 hour
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- 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

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11. Site Specific Transportation
. 1 hour

- g. Documentation
 - 1. DOT Form F5800.1
 - 2. When to document
- h. Summary
- i. Review
- j. Questions and answers

- 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

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

- 1 **COURSE:** HMT-104 - DOT Emergency Response Information
- 2 **DURATION:** . 3 hours
- 3 **PREREQUISITES:** None
- 4 **SCOPE:** This course is designed to instruct the trainee in the basic concepts of
5 applying DOT Transportation regulations involving shipments from the
6 WIPP site. This course will inform the trainee of information that may be
7 required when responding to an emergency involving transportation of
8 hazardous materials and hazardous waste from the WIPP site.
- 9 **TYPE:** Classroom
- 10 **OBJECTIVES:** Upon completion of this lesson, the trainee will be able to respond to
11 phone request from emergency personnel when hazardous materials or
12 hazardous waste are in transit from the WIPP site that may have been
13 involved in a transportation accident.
- 14 Mastery of the terminal objective will be demonstrated by scoring a
15 minimum of 80 percent on the course examination.
- 16 **REFRESHER:** None
- 17 **COURSE DESCRIPTION** (by lesson)
- 18 1. Regulations a. Emergency response information
19 . 5 hour b. Applicability
20 c. Availability
- 21 2. Logistics of an Emergency Response a. Central Monitoring Room Operator
22 . 2.5 hours response to a request for emergency
23 1. Request received at CMR
24 2. Requestor need further
25 information
26 b. Organization of Emergency
27 Response Guidebook
28 1. By placard
29 2. By shipping papers
30 3. By package hazardous waste
31 label
32 4. Highlighted entries
33 5. No available reference
34 Information
35 c. Log entries
36 d. Summary

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

- 1 **COURSE:** SAF-501 - Inexperienced Miner Training
- 2 **DURATION:** 40 Hours
- 3 **PREREQUISITES:** None (Steel-toe shoes/boots required for underground tour)
- 4 **SCOPE:** The instructor will present the required information to allow unescorted
5 underground access
- 6 **OBJECTIVES:** Fulfill all requirements of 30 CFR part 48 for underground access.
- 7 Mastery of the terminal objective will be demonstrated by satisfactory
8 performance on all practical sessions and by scoring 80 percent or higher
9 on the daily exams with no score less than 70 percent with post course
10 examination.
- 11 **REFRESHER:** SAF-502 Annually

12 **COURSE DESCRIPTION** (by lesson)

- 13 1. Introduction a. Paperwork
14 .5 hour b. Course attendance
15 1. Required attendance
16 2. Special instructions
17 c. Overview of the WIPP Underground
18 Operations
19 1. Similarity to other mining
20 operations
21 a. Potash mining
22 2. Differences to other mining
23 operations
24 a. Potash mining
25 b. Coal mining
26 d. Summary
- 27 2. Act of 1977 a. Creation of the Federal Mine
28 . 1 hour Safety and Health Act of 1977
29 1. Congressional Act
30 b. Purpose

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3. Miner's Representative
. 1 hour

4. Reporting of Hazards/Lines of Authority
. 1 hour

5. Self-Rescuer/Respiratory Devices
. 1.5 hour

- 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
 - 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
- 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
- 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

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6. Entering and Leaving the Mine
. 1 hour

- i. Respiratory protection
 - 1. The WIPP program
 - 2. Requirements
- j. Summary
 - 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

- 1 9. Mine Map
 - 2 . 1 hour
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 - 18 10. Ventilation
 - 19 . 1.5 hours
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 - 42 11. Evacuation and Escape Routes
 - 43 . 2 hours
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- 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
- 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
- a. WIPP underground evacuation procedures
 - 1. Authorization for evacuation
 - 2. Notifications
 - 3. Initial actions

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12. Ground Control
. 2.5 hours

- 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

- 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

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14. Health
. 1 hour

- 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
 - 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

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

- 1 **COURSE:** SAF-502 - Mine Safety-Experienced Miner Refresher
- 2 **DURATION:** . 8 Hours
- 3 **PREREQUISITES:** SAF-501
- 4 **SCOPE:** The instructor will update personnel of any change or modification in the
5 underground
- 6 **TYPE:** Classroom
- 7 **OBJECTIVES:** Fulfill requirements of 30 CFR part 48, for annual experienced miner
8 refresher training
- 9 Mastery of the terminal objective will be demonstrated by scoring 80
10 percent or higher on the course examination
- 11 **REFRESHER:** Annually

12 **COURSE DESCRIPTION** (by lesson)

- 13 1. Introduction a. Hand out 5000-23 MSHA Forms
14 . .5 hour b. Workplace overview
15 1. Ground control
16 2. Electrical
17 3. Air quality
18 4. Equipment
19 a. Accidents
20 b. Fires
21 c. Noise
22 c. Summary
- 23 2. Authority and Responsibility of Supervisors, a. Miner's representative
24 Miner's Representatives b. Miner's rights and responsibilities
25 . .5 hour c. Normal reporting of safety issues
26 d. Safety issues with eminent danger
27 1. Verbal notification
28 2. Protection from reporting
29 safety issues
30 3. Work refusal
31 e. Summary
- 32 3. Ventilation a. Intake volume
33 . 1 hour b. Intake points
34 1. Air Intake Shaft
35 2. Salt Handling Shaft
36 3. Waste Shaft
37 c. Exhaust volume

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- 21 4. Ground Control
22 . 1 hour
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- 27 5. Entering and Leaving the Mine
28 Transportation and Controls
29 . .5 hour
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- 37 6. Communication, Warning Alarms and
38 signals
39 . .5 hour
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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
a. Ground control
1. General employee responsibility
2. Typical ground failures
3. Ground control practices
b. Summary
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
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

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7. Mine Map, Escapeway, Emergency Evacuation and Barricades
. 1 hour
7. Accident Prevention
.5 hour
9. Self-Rescuer
.5 hour
10. First Aid
. 1 hour
- d. Alarm notification actions
1. Escapeways
2. Retreat to station for evacuation
3. Retreat to assembly areas
- e. Summary
- a. Escapeways
b. Assembly areas
1. Purpose
2. Locations
3. Personnel duties during emergencies
- c. Barricade equipment
d. Summary
- a. Event happenings
b. Changing events
c. Pre-event recognition
d. Lessons learned
e. Summary
- 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
- a. Basic principles

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

- 1 **COURSE:** RIG-001 - Incidental Rigger
- 2 **DURATION:** . 16 Hours
- 3 **PREREQUISITES:** None
- 4 **SCOPE:** The instructor will present types of rigging, how to size up the load to be
5 lifted, and the mechanical lifting devices.
- 6 **TYPE:** Classroom
- 7 **OBJECTIVES:** Upon completion of this course, the student will be able to perform
8 incidental rigger duties in compliance with the DOE Standard Hoisting
9 and Rigging Manual DOE-STD-1090-96.
- 10 Mastery of the terminal objective will be demonstrated by scoring 80
11 percent or higher on the course examination.
- 12 **REFRESHER:** None

13 **COURSE DESCRIPTION** (by lesson)

- 14 1. Identifying Rigging Components a. Qualifications
15 . 4 hours b. Definitions
16 c. Wire rope components
17 1. Core
18 2. Strand
19 3. Wire
20 d. Core
21 1. Strand
22 2. Wire
23 3. Lay of the rope
24 4. Length of the rope lay
25 5. Inspection
26 e. Web slings
27 f. Polyester slings
28 g. Wire rope slings
29 1. Inspection
30 2. Hooks
31 3. Spreader beam
32 4. Eyebolts
33 5. Shackles - anchor and chain
34 6. Wire rope clips - U bolt and
35 twin base
36 7. Turnbuckles

1 **COURSE:** OPS-115 - Conduct of Shift Operations

2 **DURATION:** . 8 hours

3 **PREREQUISITES:** None

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

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

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

11 **REFRESHER:** NONE

12 **COURSE DESCRIPTION** (by lesson)

- 13 1. DOE Guidance for Conduct of a. DOE Policy
14 Operations and Basic Requirements b. DOE Orders
15 . 1 hour c. Conduct of operations sections
16 1. Operations organization and
17 administration
18 2. Shift routines and operating
19 practices
20 3. Control area activities for the
21 WIPP
22 4. Communications
23 5. Control of on-shift training
24 6. Investigation of abnormal
25 events
26 7. Notifications
27 8. Control of equipment and
28 system status
29 9. Tagouts and lockouts
30 10. Independent verification
31 11. Logkeeping
32 12. Operations turnover
33 13. Operations aspects of facility
34 unique processes
35 14. Required reading
36 15. Timely orders to operators
37 16. Operations procedures
38 17. Operator aid posting
39 18. Equipment and piping labeling

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2. Sections of Conduct of Operations

. 5 hours

A. Communications

- 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

- 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

- 1 E. Operator Aid Postings
- 2 F. Equipment and Piping Labeling
- 3 a. Requirements
- 3 b. Identifying labeling deficiencies
- 4 G. Shift Requirements
- 5 a. Routines and operating practices
- 5 1. Status practices
- 6 2. Safety practices
- 7 3. Operator inspection tours
- 8 4. Round/tour inspection sheets
- 9 5. Personnel protection
- 10 6. Response to indications
- 11 7. Resetting protective devices
- 12 8. Load changes
- 13 9. Authority to operate equipment
- 14 10. Shift operating bases
- 15 H. Control of On-Shift Training
- 16 a. Adherence to training programs
- 17 b. On-shift instructor qualification
- 18 c. Supervision and control of trainees
- 19 d. Operator qualification program
- 20 approval
- 21 e. Training documentation
- 22 f. Suspension of training
- 22 g. Maximum number of trainees
- 23 I. Logkeeping
- 24 a. Establishment of operating logs
- 25 b. Timeliness of recordings
- 26 c. Information to be recorded
- 27 d. Legibility
- 28 e. Corrections
- 29 f. Log review
- 29 g. Care and keeping of logbooks
- 30 J. Operations Turnover
- 31 a. Turnover checklists
- 32 b. Document review
- 33 c. Control panel walk-down
- 34 d. Discussion and exchange of
- 35 responsibility
- 36 e. Shift crew briefing
- 36 f. Reliefs occurring during the shift
- 37 K. Operations Aspects of Facility
- 38 Unique Processes
- 39 a. Operator responsibilities
- 40 b. Operator knowledge
- 41 c. Operator response to process
- 42 problems
- 42 d. Communications between
- 42 operations and process personnel

- 1 L. Required Reading
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- 3 a. File Index
- 4 b. Reading assignments
- 5 c. Required dates for completion of
- 6 reading
- 7 d. Documentation
- 8 e. Review

- 9 M. Timely Orders to Operators
- 10 a. Content and format
- 11 b. Issuing, segregating, and reviewing
- 12 orders
- 13 c. Removal of orders

- 14 3. Summary

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

- 1 **COURSE:** TRG-296 - Root Cause Analysis
- 2 **DURATION:** . 8 hours
- 3 **PREREQUISITES:** None
- 4 **SCOPE:** The instructor will provide personnel with the knowledge and skills
5 necessary to identify the root cause of unplanned plant events, in
6 accordance with DOE standards. Students will analyze incidents to
7 identify corrective action necessary to prevent the incidents from
8 recurring. This training is recommended for all operators, technicians,
9 supervisors, and managers.
- 10 **TYPE:** Classroom And Practical
- 11 **OBJECTIVES:** Upon completion of this course, the student will be able to perform root
12 cause analysis in accordance with DOE Order 232.1.
- 13 Mastery of the terminal objective will be demonstrated by scoring 80
14 percent or higher on the course examination and satisfactory
15 performance on the practical examination.
- 16 **REFRESHER:** None

17 **COURSE DESCRIPTION** (by lesson)

- 18 1. Introduction to Root Cause Analysis a. Case study
19 . 2 hours b. Root cause
20 c. Other causes
21 d. Event
22 e. Event/cause relationship
23 f. Root cause analysis
24 g. Reason for root cause analysis
25 1. Overview
26 2. Specifics
27 3. Concern - employees
28 4. Concern - facility
29 5. Concern - company
30 permanent image
31 6. Concern - public and
32 environment
33 7. Concern - economic
34 8. Concern - legal

- 1 2. Root Cause Analysis Process
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25 3. Root Cause Analysis at the WIPP
26 . 1 hour
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32 4. Summary
33 . 1 hour
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35 5. Homework
- 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
- a. Investigations
b. Reportable and non-reportable events
c. Root cause analysis team report
d. Reportable events
e. Non-reportable events
f. Follow-up

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

- 1 **COURSE:** SAF-645 - RCRA Emergency Coordinator (WIPP Contingency Plan
2 Procedure)
- 3 **DURATION:** N/A
- 4 **PREREQUISITES:** None
- 5 **SCOPE:** This self-paced lesson describes the responsibilities and actions to be
6 taken by the RCRA Emergency coordinator and other emergency
7 response personnel whenever the WIPP Contingency Plan is
8 implemented.
- 9 **TYPE:** Self-paced
- 10 **OBJECTIVES:** Upon completion of this course, the student will be able to perform the
11 duties of RCRA Emergency Coordinator in accordance with established
12 requirements.
- 13 Mastery of the terminal objective will be demonstrated by scoring 80
14 percent or higher on the course examination.
- 15 **REFRESHER:** None
- 16 1. State the purpose of the RCRA Contingency Plan.
- 17 2. Describe the general responsibilities of the RCRA Emergency
18 Coordinator.
- 19 3. Identify the emergency response groups and their responsibilities.
- 20 4. State when the Contingency Plan is to be implemented.
- 21 5. Describe the criteria for Incident Levels I, II, and III.
- 22 6. Describe the types of events that do not implement the
23 Contingency Plan.
- 24 7. Describe the activities regarding initial response and notification of
25 emergency response personnel.
- 26 8. Describe the actions to be taken when a surface evacuation is
27 declared.
- 28 9. Describe the action to be taken when an underground evacuation
29 is declared.
- 30 10. State the information that is included in notifications to public
31 safety and regulatory safety agencies.

- 1 11. Describe the various means of identifying hazardous materials.
- 2 12. Describe the information that is initially provided to the Emergency
3 Coordinator by the EST.
- 4 13. Describe the additional information that is collected to conduct a
5 more thorough assessment.
- 6 14. Define the 4 criteria that are evacuated in the assessment stage of
7 an incident.
- 8 15. State when the RCRA Emergency Coordinator would request
9 assistance from off-site agencies.
- 10 16. Describe the actions involved in the control, containment, and
11 correction of an incident.
- 12 17. Describe physical and chemical methods of mitigation.
- 13 18. Describe the actions that are implemented in the event of a fire.
- 14 19. Describe the actions to be taken in the event of an explosion.
- 15 20. Describe the actions to be taken in the event of a spill.
- 16 21. Describe the actions to be taken in the event of container spills or
17 leakage.
- 18 22. State who is responsible for the radiological decontamination of
19 personnel.
- 20 23. Describe the response actions to spills, or leaking, or punctured
21 CH and RH TRU mixed waste containers.
- 22 24. Describe the actions to be taken in the event of a natural
23 emergency (earthquake, lightning strike, etc.) involving hazardous
24 waste or materials.
- 25 25. Describe the response efforts in the event of spalling of ground in
26 the underground.
- 27 26. Describe the response efforts in the event of a roof fall in the
28 underground.
- 29 27. Describe the events to be completed during the emergency
30 termination phase.

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

1 **COURSE:** SAF-621 - Firefighter I

2 **DURATION:** . 40 hours

3 **PREREQUISITES:** None

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

6 **OBJECTIVES:**

7 **REFRESHER:** Training is conducted 8 hours quarterly

8 **COURSE DESCRIPTION** (by lesson)

- 9 1. Inspection a. Common causes of fires and their
10 .5 hour classroom prevention
11 b. Fire protection procedures
12 c. Define importance of public relations
13 d. Define dwelling inspection
14 procedures
- 15 2. Sprinklers a. Identify a fire department
16 .5 hour classroom sprinkler connection and water
17 motor alarm
18 b. Connect hose lines to a fire
19 department connection of a sprinkler
20 or standpipe system
21 c. Define how automatic sprinkler
22 heads open and release water
23 d. Temporarily stop flow of water from
24 a sprinkler head
- 25 3. Overhaul a. Demonstrate searching for
26 . 2 hours classroom hidden fires
27 b. Demonstrate exposure of hidden
28 fires by opening ceilings, walls,
29 floors, and pulling apart burned
30 material
31 c. Demonstrate how to separate and
32 remove charred materials from
33 unburned material
34 d. Define duties of fire fighters left at
35 the scene for fire and security
36 surveillance
37 e. Identify the purpose of overhaul

- 1 4. Salvage
2 . 1.5 hours classroom
3 . .5 hours practical
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- 9 5. Fire Streams
10 . 1.5 hours classroom
11 . 2.5 hours practical
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- 16 6. Fire Hoses, Nozzles, and Appliances
17 . 2.5 hours classroom
18 . 3.5 hours practical
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- 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
- 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
- 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

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- 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
- 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
- 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

7. Forcible Entry
. 3 hours classroom
. 1 hour practical

8. Ladders
. 1.5 hours classroom
. 2.5 hours practical

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- 9. Rescue
 - . 5 hour classroom
 - . 1.25 hours practical

- 10. Self-Contained Breathing Apparatus
 - . 2 hours classroom
 - . 2 hours practical

- 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

- 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

- 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

- 1 11. Ropes
2 . 2 hours class room and practical
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- 20 12. Ventilation
21 . 5 hours classroom
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- 35 13. Safety
36 . 1 hour classroom
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- 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
- 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
- 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

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14. Fire Behavior
. 3 hours

- 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
- 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
- 2 **DURATION:** 20 Hours
- 3 **PREREQUISITES:** Physical, underground experience
- 4 **SCOPE:**
- 5 **TYPE:** Classroom, field, hands-on
- 6 **OBJECTIVES:** Upon completion of this training, the student will be able to wear and
7 maintain a Drager self-contained breathing apparatus, and perform all the
8 functions required as a member of a mine rescue team.
- 9 **REFRESHER:** 48 hours of refresher training is required annually

10 **COURSE DESCRIPTION** (by lesson)

- 11 1. MSHA 2004 (Drager BG 174-A) a. Description
12 . 8 hours b. Major parts
13 c. Wearing and testing
14 d. Limitations
15 e. Maintenance
- 16 2. MSHA 2202 (Mine Gases) a. Meaning of terms
17 . 2 hours 1. Specific gravity
18 2. Explosive range
19 3. Toxicity
20 4. Asphyxiate
21 5. Solubility
22 b. Physical properties and
23 characteristics
24 1. Normal air
25 2. Oxygen
26 3. Nitrogen
27 4. Carbon dioxide
28 5. Carbon monoxide
29 6. Oxides of nitrogen
30 7. Hydrogen
31 8. Hydrogen sulfide
32 9. Sulfur dioxide
33 10. Methane
34 c. Composition, physical properties,
35 and characteristics
36 1. Smoke
37 2. Rock strata gases
38 3. Damps

- 1 3. MSHA 2203 (Mine Ventilation)
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- 7 4. MSHA 2204 (Mine Exploration)
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- 18 5. MSHA 2205 (Firefighting)
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- 24 6. MSHA 2206 (Rescue of Survivors)
25 . 2 hours
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- 28 7. MSHA 2207 (Mine Recovery)
29 . 2 hours
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- a. Purpose and methods
b. Ventilation controls
c. Proper chain-of-command when altering ventilation
d. Air measurement devices
e. Construction of ventilation controls
- 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
- a. Classification of fires
b. Firefighting equipment
c. Firefighting techniques
1. Indirect
2. Direct
d. Explosions
- a. Rescuing survivors
1. Rescue techniques
2. First aid
b. Recovery of bodies
- a. Assessing conditions
b. Reestablishing ventilation
c. Clearing and rehabilitating

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

- 1 **COURSE:** Radiological Control Technician Fundamental Academic Lessons
- 2 **DURATION:** - 52 hours
- 3 Students may elect to test out of these courses with Radiological Control
- 4 Manager approval
- 5 **PREREQUISITES:** Lesson specific
- 6 **SCOPE:** Lesson specific
- 7 **REFRESHER:** Requalification every two years

8 **COURSE DESCRIPTION** (by module)

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

- 10 a. Prerequisites - None
- 11 b. Scope - This lesson is a review of arithmetic and algebraic methods used to
- 12 perform various radiological control calculations required by the RCT to
- 13 perform his/her daily duties. These calculations include scientific notation, unit
- 14 analysis and conversion, radioactive decay calculations, dose rate/distance
- 15 calculations, shielding calculations, and stay-time calculations.
- 16 c. Outline - Introduction
- 17 - Basic math operations with fractions
- 18 - Basic math operations with decimals
- 19 - Convert fractions to decimals and vice-versa
- 20 - Convert percent to decimal and vice-versa
- 21 - Basic math operations with signed numbers
- 22 - Basic math operations with exponents
- 23 - Find rational square roots
- 24 - Convert scientific notation to standard form and vice-versa
- 25 - Basic math with scientific notation
- 26 - Solving equations using the "Order of Mathematical Operations"
- 27 - Performing algebraic functions
- 28 - Solving equations with common and natural logarithms
- 29 - Exam

- 1 **2. Unit Analysis and Conversion (CL1.02) . 4 hours**
- 2 a. Prerequisites - None
- 3 b. Scope - This lesson is a review of the unit analysis and conversion process
- 4 necessary for the RCT to perform air and water sample activity calculations,
- 5 contamination calculations, and many other applications.
- 6 c. Outline - Introduction
- 7 - Unit systems of measurement and base units for mass, length and time
- 8 - SI prefix values and abbreviations
- 9 - Using conversion factors/tables
- 10 - Using formulas
- 11 - Exam
- 12 **3. Physical Sciences (CL1.03) . 4 hours**
- 13 a. Prerequisites - None
- 14 b. Scope - This lesson is a review of basic physics since the RCT may work in
- 15 environments where materials can undergo changes in state, resulting in
- 16 changes in the radiological work environment.
- 17 c. Outline - Introduction -
- 18 - Work/force/energy in relation to physics
- 19 - Identify and describe four forms of energy
- 20 - State the Law of Conservation of Energy
- 21 - Solid/liquid/gas in regards to shape and volume
- 22 - Basic atom structure
- 23 - Defining physical science terms
- 24 - Identifying symbols
- 25 - Periodic Table element arrangement
- 26 - Identifying Periodic Table layout
- 27 - Defining terms relative to atomic structure
- 28 - Exam
- 29 **4. Nuclear Physics (CL1.04) . 4 hours**
- 30 a. Prerequisites - None
- 31 b. Scope - This lesson is designed to provide an understanding of the forces
- 32 present within an atom.
- 33 c. Outline - Introduction
- 34 - Definitions: Nucleon, Nuclide, Isotope
- 35 - Mass-Energy Equivalence Concept
- 36 - Definitions: Mass Defect, Binding Energy
- 37 - Definitions: Fission, Criticality, Fusion
- 38 - Exam
- 39 **5. Sources of Radiation (CL1.05) . 4 hours**
- 40 a. Prerequisites - None

- 1 b. Scope - This lesson provides an understanding that radiation sources are not
2 limited to nuclear facilities. The study of radiation sources provides data for:
3 - The basis for occupational exposure
4 - Showing the effects from high source exposures
5 - Assessing the impact on radiation background from nuclear facilities
6 - Determining the use of building materials
7 c. Outline - Introduction
8 - Identifying natural background radiation sources
9 - Identifying artificially produced radiation sources and dose magnitudes
10 from each source
11 - Exam

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

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

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

- 34 a. Prerequisites - None
35 b. Scope - This lesson provides an understanding of how different types of
36 radiation interacts with different types of matter.
37 c. Outline - Introduction
38 - Define ionization, excitation, bremsstrahlung
39 - Defining specific ionization, linear energy transfer (LET), stopping power,
40 range, and W-value
41 - Alpha particle energy transfer
42 - Energy transfer for beta particulate radiation
43 - Gamma photon interaction with matter
44 - Kinetic energies of various types of neutrons

- 1 - Slow neutron capture
2 - Scattering interactions for fast neutrons
3 - Characteristics of materials shielding alpha, beta, gamma and neutron
4 radiations
5 - Exam
- 6 **8. Biological Effects of Radiation (CL-1.08) . 4 hours**
- 7 a. Prerequisites - None
8 b. Scope -This lesson provides a basic understanding of the methods in which
9 radiation may cause biological damage so that the RCT may protect
10 themselves and the workers from unnecessary exposure to ionizing radiation.
11 c. Outline - Introduction
12 - Function of various cell structures
13 - Effects of radiation on cell structures
14 - Law of Bergonie and Tribondeau
15 - Factors affecting radiosensitivity of cells
16 - Most and least radiosensitive cells
17 - Reactions on cells from ionizing radiation
18 - Definitions: stochastic, non-stochastic effect
19 - LD 50/30 value for humans
20 - Somatic effects of chronic radiation exposure
21 - Three types of acute radiation syndromes and associated exposure levels
22 and symptoms
23 - Radiation exposure risks to embryo and fetus
24 - Somatic and heritable effects
25 - Exam
- 26 **9. Radiological Protection Standards (CL1.09) . 4 hours**
- 27 a. Prerequisites - None
28 b. Scope -This lesson provides an understanding of the history of the
29 development of the limits to show why the current limits of exposure are
30 imposed. This lesson also provides an awareness of the current CFRs and
31 DOE Orders that may affect the RCTs at the work place.
32 c. Outline - Introduction
33 - Role of advisory agencies in developing radcon recommendations
34 - Role of regulatory agencies in developing standards and regulations
35 - DOE RCM purpose and scope
36 - DOE RCM use of “shall” and “should”
37 - Exam
- 38 **10. ALARA (CL1.10) . 4 hours**
- 39 a. Prerequisites - None
40 b. Scope - This lesson provides an understanding of the ALARA philosophy and
41 shows the methods for the RCT to establish and maintain the commitment to

1 ALARA that all personnel at the facility must have for a safe radiological work
2 place.

- 3 c. Outline - Introduction
4 - Base assumptions for ALARA philosophy
5 - Collective personnel and individual exposure
6 - Effective radiological ALARA program
7 - Purposes of pre- and post-job reviews
8 - RCT responsibilities for implementation
9 - Exam

10 **11. External Exposure Control (CL1.11) . 4 hours**

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

31 **12. Internal Exposure Control (CL1.12) . 4 hours**

- 32 a. Prerequisites - None
33 b. Scope - This lesson is designed to familiarize the technician with those
34 actions necessary as a result of the entry of radioactive materials into the
35 body and the basis for those actions.
36 c. Outline - Introduction
37 - Four ways radioactive material enters the body
38 - Methods to prevent/minimize entry of radioactive material
39 - Defining and distinguishing ALI and DAC
40 - Determining basis for ALI
41 - Defining "reference man"
42 - Using DACs to minimize internal exposure
43 - Behavior of radioactive materials in the body
44 - Natural reductions of radionuclides in body

- 1 - Relationship between physical, biological and effective half lives
- 2 - Calculating effective half life
- 3 - Medical elimination methods
- 4 - Exam

5 **13. Radiation Detector Theory (CL1.13) . 4 hours**

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

- 1 **COURSE:** Radiological Control Technician Site-Specific Academic Lessons
- 2 **DURATION:** . 88 hours
- 3 **PREREQUISITES:** Lesson specific
- 4 **SCOPE:** Lesson specific
- 5 **1.** Counting Errors and Statistics (CL2.03) . 4 hours
- 6 a. Prerequisites - CL1.01 through CL1.13
- 7 b. Scope - This lesson provides a basic knowledge of the random process of
- 8 detecting and measuring radioactivity and the associated counting errors
- 9 involved with that process. The RCTs will use this knowledge when obtaining
- 10 the radioactivity measurements to make decisions that may affect the health
- 11 and safety of workers at the facility and its surrounding environments
- 12 c. Outline - Introduction
- 13 - Analyzing errors and their effect on sample measurements
- 14 - Sample analysis statistics applications
- 15 - Defining mean, median, and mode
- 16 - Determining mean, median, and mode
- 17 - Defining variance and standard deviation
- 18 - Calculating the standard deviation
- 19 - Purpose of Chi-squared test
- 20 - Criteria for acceptable Chi-squared values at the WIPP
- 21 - Purpose of creating quality control charts
- 22 - WIPP QC chart maintenance and review requirements
- 23 - Purpose of warning and control limits
- 24 - Purpose of efficiencies and correction factors
- 25 - Calculating efficiencies and correction factors
- 26 - Meaning of counting data reported as " $x \pm y$ "
- 27 - Reporting results to desired confidence level
- 28 - Purpose of determining background
- 29 - WIPP methods and requirements for determining background
- 30 - Purpose of performing sample planchet maintenance
- 31 - WIPP method and requirements of performing planchet maintenance for
- 32 counting systems
- 33 - Methods to improve statistical validity of sample measurements
- 34 - Defining and explaining "detection limits"
- 35 - Calculate detection limit values at WIPP
- 36 - Purpose, method, and criteria for acceptable values of determining
- 37 crosstalk at the WIPP
- 38 - Purpose and method of performing voltage plateau
- 39 - Exam
- 40 **2.** Dosimetry (CL2.04) . 4 hours
- 41 a. Prerequisites - None

- 1 b. Scope - This lesson introduces the types of dosimeters used to measure
2 external radiation to people at the facility. The material presented in this
3 lesson is valuable to RCTs since dosimeters are the only direct method to
4 measure and document personnel radiation exposure and ensure regulatory
5 compliance with applicable limits.
6 c. Outline - Introduction
7 - DOE occupational worker external exposure limits
8 - DOE established limits for embryo/fetus
9 - WIPP administrative exposure control guidelines for radiation/non-
10 radiation workers, incidents and emergencies, and unborn children
11 - Requirements for pregnant worker
12 - Theory of operation of a TLD
13 - Theory of operation of a TLD reader
14 - Advantages and disadvantages of a TLD
15 - WIPP beta-gamma TLDs
16 - WIPP neutron TLDs
17 - WIPP TLD use requirements
18 - WIPP personnel neutron dosimeter types and principle of operation
19 - WIPP self-reading dosimetry (SRD) principle of operation
20 - WIPP alarming dosimeter use guidelines and principle of operation
21 - WIPP bioassay monitoring methods
22 - Exam

23 **3. Contamination Control (CL2.05) . 4 hours**

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

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

- 40 a. Prerequisites - None
41 b. Scope - This lesson provides an overview of the air sampling program and the
42 methods for obtaining airborne radioactivity concentration in an area to ensure
43 that the control measures assigned are effective and continue to be effective.
44 c. Outline - Introduction

- 1 - Primary objectives of air monitoring program
- 2 - Three physical states of radiation contaminants
- 3 - Ensuring a representative air sample
- 4 - Defining "isokinetic sampling"
- 5 - Six methods for obtaining samples and their principle of operation
- 6 - Selection of air monitoring methods
- 7 - Purpose of five types of samplers/monitors
- 8 - Factors affecting accuracy of measurements
- 9 - WIPP air monitoring program
- 10 - Exam

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

- 12 a. Prerequisites - None
- 13 b. Scope - This training laboratory provides the initial on-the-job training for the
- 14 job performance measures (JPMs) pertaining to the Airborne Sampling
- 15 Program/Methods.
- 16 c. Outline - Introduction
- 17 - Collecting FAS filters
- 18 - Analyzing air sample for radioactivity
- 19 - Changing 'Station A' FAS filters
- 20 - Determining appropriate respiratory equipment based on air activity

21 **6. Radiological Source Control (CL2.08) . 4 hours**

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

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

- 33 a. Prerequisites - None
- 34 b. Scope - This lesson presents instruction in Radiological Work Permits, various
- 35 types of postings used in radiological areas, setting up radiological areas,
- 36 access controls, and releasing of material from radiological areas.
- 37 c. Outline - Introduction
- 38 - Purpose and information on Radiological Work Permit (RWP) including
- 39 WIPP classifications
- 40 - Responsibilities in using or initiating RWP
- 41 - WIPP document that governs our ALARA program
- 42 - WIPP establishment of exposure/performance goals

- 1 - WIPP conditions requiring a pre-job ALARA review
- 2 - WIPP conditions requiring a post-job ALARA review
- 3 - Purpose of postings, signs, labels and barricades; and RCTs
- 4 responsibilities for them
- 5 - WIPP postings, requirements for postings/barriers, and entry requests for
- 6 various radiological areas
- 7 - Setting up radiological areas
- 8 - Containment device discrepancies
- 9 - Setting up portable ventilation systems and count rate meters
- 10 - Requirements while working in RBAs
- 11 - Requirements for removing or releasing materials from any radiological
- 12 area
- 13 - Exam

14 **8. Radiological Work Coverage (CL2.11) . 4 hours**

- 15 a. Prerequisites - None
- 16 b. Scope - This lesson covers the methods of job coverage by RCTs to assist
- 17 radiological workers in keeping their radiation exposures ALARA.
- 18 c. Outline - Introduction
- 19 - Three purposes of job coverage
- 20 - Continuous and intermittent job coverage
- 21 - Conditions that require job coverage
- 22 - Planning job coverage
- 23 - Pre-job briefing discussions
- 24 - Worker and technician exposure control techniques
- 25 - WIPP in-progress radiological surveys
- 26 - WIPP documentation of in-progress surveys
- 27 - Actions taken for unexpected survey results
- 28 - Contamination control techniques
- 29 - Preventative job coverage techniques
- 30 - Overall job control techniques
- 31 - WP 12-5 reasons to stop radiological work activities
- 32 - Exam

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

- 34 a. Prerequisites - None
- 35 b. Scope -
- 36 c. Outline - Introduction
- 37 - Regulatory agencies for radioactive material transport
- 38 - Defining the DOT terms: LSA, Limited Quantity, Transport Index,
- 39 Exclusive Use, and Closed Transport Vehicle
- 40 - Determining radionuclide contents of a package
- 41 - Radiation and contamination surveys and applicable limits performed on
- 42 packages
- 43 - Radiation and contamination surveys and applicable limits performed on
- 44 exclusive use vehicles

- 1 - Placement of placards on transport vehicles
- 2 - WIPP shipment release inspection criteria
- 3 - WIPP procedures for receipt and shipment
- 4 - WIPP procedures for shipments exceeding limits
- 5 - WIPP procedures for opening packages
- 6 - Exam

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

- 8 a. Prerequisites - None
- 9 b. Scope - This lesson covers the necessary immediate and supplementary
- 10 actions for responding to radiological emergencies and abnormal events. This
- 11 lesson also reveals that, although most people do not take incident response
- 12 planning seriously because they do not expect the unexpected, incidents do
- 13 occur, and experience has shown that best response comes from workers
- 14 who have prepared themselves with a plan for dealing with incidents.
- 15 c. Outline - Introduction
- 16 - RCT general response and responsibilities
- 17 - Emergency equipment and facilities, including location and contents of
- 18 emergency equipment kits
- 19 - RCT response to CAM alarm
- 20 - RCT response to personnel contamination monitor alarm
- 21 - RCT response to off scale or lost dosimetry
- 22 - RCT response to radiation levels or area alarm
- 23 - RCT response to dry or liquid spill
- 24 - RCT response to fire in a radiological area or involving radioactive
- 25 materials
- 26 - RCT response to other incidents
- 27 - Emergency response levels
- 28 - Incident documentation procedures
- 29 - Emergency response team structure
- 30 - Offsite incident support groups
- 31 - Plant incidents, including cause, prevention, and response
- 32 - Exam

33 **11. Personnel Decontamination (CL2.14) . 4 hours**

- 34 a. Prerequisites - None
- 35 b. Scope - This lessons outlines the best methods available to control or oversee
- 36 the decontamination of a contaminated individual.
- 37 c. Outline - Introduction
- 38 - Three factors in personnel decontamination
- 39 - Required RCT preliminary actions and notifications for contaminated
- 40 individual
- 41 - RCT response to clothing contamination
- 42 - RCT response to skin contamination
- 43 - Using decontamination reagents to decontaminate personnel
- 44 - Exam

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

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

15 **13. Radiation Survey Instrumentation (CL2.16) . . . 4 hours**

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

28 **14. Contamination Monitoring Instrumentation (CL2.17) . . . 4 hours**

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

- 1 **15. Air Sampling Equipment (CL2.18) . 4 hours**
- 2 a. Prerequisites - None
- 3 b. Scope
- 4 c. Outline - Introduction
- 5 - WIPP portable air sampler (PAS) selection
- 6 - Physical and operating characteristics and limitation(s) of WIPP portable
- 7 air samplers
- 8 - Physical and operating characteristics and limitation(s) of WIPP motor air
- 9 pumps
- 10 - Pre-operational checkout of WIPP PASs
- 11 - Physical and operating characteristics and limitation(s) of WIPP beta-
- 12 gamma CAMs
- 13 - Physical and operating characteristics and limitation(s) of WIPP alpha
- 14 CAMs
- 15 - Exam
- 16 **16. Counting Room Equipment (CL2.19) . 4 hours**
- 17 a. Prerequisites - None
- 18 b. Scope - This lesson covers counting room equipment in relation to types
- 19 used, purpose for, radiation monitored, operational requirements, and specific
- 20 limitations and characteristics. The RCT uses information from these counting
- 21 instruments to identify and assess the hazards presented by contamination
- 22 and airborne radioactivity and establish protective requirements for work
- 23 performed in radiological areas.
- 24 c. Outline - Introduction
- 25 - WIPP Scintillation Alpha and Beta laboratory counter/scalers' features
- 26 and specifications
- 27 - WIPP low background auto alpha/beta proportional counting system
- 28 features and specifications
- 29 - Exam

- 1 **COURSE:** Radiography
- 2 **TYPE:** Classroom/OJT
- 3 **OBJECTIVES:** Upon completion of this course, the student will be able to perform
- 4 radiography in a safe manner and will be able to confirm whether waste
- 5 contains ignitable, corrosive, or reactive waste.
- 6 Successfully pass a comprehensive exam based upon training enabling
- 7 objectives. The comprehensive exam will address the radiography
- 8 operation, documentation, and procedural elements stipulated in this
- 9 WAP.
- 10 Perform practical capability demonstration in the presence of appointed
- 11 site Permittee radiography subject matter expert.

12 **REFRESHER:** Biennially

13 **COURSE DESCRIPTION**

14 Radiography operators shall be instructed in the specific waste generating practices and typical

15 packaging configurations expected to be found in each Waste Matrix Code at each site shipping

16 waste to WIPP. The OJT and apprenticeship shall be conducted by an experienced, qualified

17 radiography operator prior to qualification of the training candidate.

18 The Permittees' radiography training program includes:

19 **Formal Training**

- 20 C Project Requirements
- 21 C State and Federal Regulations
- 22 C Basic Principles of Radiography
- 23 C Radiographic Image Quality
- 24 C Radiographic Scanning Techniques
- 25 C Application Techniques
- 26 C Radiography of Waste Forms
- 27 C Standards, Codes, and Procedures for Radiography
- 28 C Waste Stream-Specific Instruction

29

30 **On-the-Job Training**

- 31 C System Operation
- 32 C Identification of Packaging Configurations
- 33 C Identification of Waste Material Parameters/Waste Matrix Codes
- 34 C Identification of excess residual liquids as defined in the TSDF-WAC, sealed
- 35 containers greater than four liters (nominal), and compressed gases
- 36 C Verification of waste stream description

37

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

- 5 C Aerosol can with puncture
- 6 C Horsetail bag
- 7 C Pair of coveralls
- 8 C Empty bottle
- 9 C Irregular shaped pieces of wood
- 10 C Empty one gallon paint can
- 11 C Full container
- 12 C Aerosol can with fluid
- 13 C One gallon bottle with three tablespoons of fluid
- 14 C One gallon bottle with one cup of fluid (upside down)
- 15 C Leaded glove or leaded apron
- 16 C Wrench

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

18 Requalification of operators shall be based upon evidence of continued satisfactory
19 performance (primarily video/audio reviews) and shall be done at least every two years.
20 Unsatisfactory performance will result in disqualification. Unsatisfactory performance is defined
21 as the misidentification of excess residual liquids (as defined in the TSDF-WAC), sealed
22 containers greater than four liters (nominal), except for inorganic solids packaging in metal
23 cans, or compressed gases) in a training drum or a score of less than eighty percent (80%) on
24 the comprehensive exam. Retraining and demonstration of satisfactory performance are
25 required before a disqualified operator is again allowed to operate the radiography system for
26 the Permittees.

1 **COURSE:** Visual Examination

2 **TYPE:** Classroom/OJT

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

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

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

13 **REFRESHER:** Biennially

14 **COURSE DESCRIPTION**

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

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

23 Visual examination personnel shall be requalified once every two years.

24 The visual examination training program includes:

25 Formal Training

- 26 C Project Requirements
- 27 C State and Federal Regulations
- 28 C Application Techniques
- 29 C Waste Stream-Specific Instruction (e.g., specific waste generating processes,
30 typical packaging configurations, waste material parameters)

31 On-the-Job Training

- 32 C Identification of Packaging Configurations
- 33 C Identification of Waste Material Parameters/Waste Matrix Code

- 1 C Identification of Prohibited Items liquids as defined in the TSDF-WAC, sealed
- 2 containers greater than four liters (nominal), and compressed gases
- 3 C Verification of waste stream description

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1

Qualification Cards

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- 1 **QUALIFICATION CARD:** CH Waste Handling Technician (WH-01A, WH-01B)
2 CH Waste Handling Engineer (WH-02)
- 3 **DURATION:** Nine to twelve months
- 4 **CLASSROOM TRAINING:** Various classroom courses are utilized to provide operators the
5 requisite training as part of the qualification process. The
6 candidate must satisfactorily complete the classroom training
7 courses prior to completion of the qualification card.
- 8 **SCOPE:** The CH Waste Handling Technician Qualification Card (WH-01A
9 Backfill Technician, and Emplacement Technician, and WH-01B
10 Waste Handling Technician) and CH Waste Handling Engineer
11 Qualification Card (WH-02 Waste Handling Operations
12 Qualification Card Guide Book [WH-GUIDE-1]).
- 13 **REFERENCES:** CH Waste Handling Technician Qualification Card (WH-01)
14 CH Waste Handling Engineer Qualification Card (WH-02)
15 Waste Handling Operations Qualification Card Guide Book (WH-
16 GUIDE-1)

17 **QUALIFICATION CARD DESCRIPTION (by category)**

18 **1. Equipment Knowledge Requirements**

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

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

26 **2. Equipment Operation Practical Requirements**

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

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

1 **3.** Integrated Process Knowledge Requirements

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

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

8 **4.** Integrated Process Practical Requirements

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

11 Demonstrate competency in management of site derived waste.

12 Demonstrate competency in performing container storage area inspections.

13 Walkdown the various facility support systems that affect waste handling.

1 **QUALIFICATION CARD:** RH Waste Handling Technician (RH-01A, RH-01B, RH-01C)
2 RH Waste Handling Engineer (RH-02)

3 **DURATION:** Nine to twelve months

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

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

11 **REFERENCES:** RH Waste Handling Technician Qualification Card
12 RH Waste Handling Engineer Qualification Card
13 Waste Handling Operations Qualification Card Guide Book

14 **QUALIFICATION CARD DESCRIPTION (by category)**

15 **1. Equipment Knowledge Requirements**
16 Demonstrate knowledge of the following for the various pieces of RH waste handling
17 equipment and systems:

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

23 **2. Equipment Operation Practical Requirements**

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

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

28 **3. Integrated Process Knowledge Requirements**

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

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

- 1 **4. Integrated Process Practical Requirements**
- 2 Demonstrate competency in performing administrative duties for equipment/system
- 3 isolation and control.
- 4 Demonstrate competency in management of site derived waste.
- 5 Demonstrate competency in performing container storage area inspections.
- 6 Walkdown the various facility support systems that affect waste handling.

- 1 **QUALIFICATION CARD:** Radiological Control Technician (RCT)
- 2 **DURATION:** . 9 working months
- 3 **CLASSROOM TRAINING:** Various classroom courses are utilized to reinforce the training
4 received as part of the qualification card. The candidate is
5 required to complete
- 6 **SCOPE:**
- 7 **REFERENCES:** WP 12-5, WIPP Radiological Control Manual
8 WP 12-HP, WIPP OHP Procedures Manual
9 WP 12-RE, Rad Engineering Procedures Manual

10 **QUALIFICATION CARD DESCRIPTION (by category)**

11 **1. Academics Training**

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

14 **2. Practical Training**

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

17 Demonstrate generation of a Radiological Work Permit.

18 Demonstrate how a radiological area should be posted.

19 Demonstrate applicable emergency response to various events.

20 Demonstrate competency in operating various types of monitoring equipment.

21 **3. Written Examination**

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

25 **4. Oral Examination Board**

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

- 1 **QUALIFICATION CARD:** EST-01 Emergency Services Technician
- 2 **DURATION:** 2 Years
- 3 **PREREQUISITES:** The candidate must be current in CPR and possess an EMT-I
4 License.
- 5 **CLASSROOM TRAINING:** Additional classroom training courses are required prior to
6 completion of this qualification card.
- 7 **SCOPE:** This qualification card must be completed by all candidates prior
8 to standing a watch unsupervised. Qualification is a six month
9 process. The individual may perform duties without direct
10 supervision only for those evolutions and/or operations for which
11 training has been completed.
- 12 All signatures must be made by an approved Subject Matter
13 Expert. The signatures indicate that the trainee has demonstrated
14 satisfactory knowledge and performance of the task(s) indicated.
- 15 **REFERENCES:** Emergency Services Technician Qualification Card Guide Book
16 (EST-01G)
17 WIPP Emergency Management Program (WP 12-9)
18 Emergency Fire Pump (WP 04-FP2202)
19 Inspection and Testing of Sprinkler Systems
20 1. Wet Pipe Fire Sprinkler System Testing (PM000025)
21 2. NFPA 13, Installation of Sprinkler Systems

22 **QUALIFICATION CARD DESCRIPTION** (by category)

23 **1. Knowledge Requirements**

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

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

1 **2.** Practical Requirements

2 Demonstrate competency in the following areas:

- 3 ● Use of fire suppression apparatus and equipment.
- 4 ● Use of rescue apparatus and equipment.
- 5 ● Inspection and testing techniques and completion of corresponding forms.
- 6 ● Operation of ambulance and operation and application of all ambulance equipment
- 7 and supplies.
- 8 ● Application of all hazardous materials equipment and supplies for control and
- 9 mitigation.

- 1 **QUALIFICATION CARD:** FPT-01 Fire Protection Technician
- 2 **DURATION:** 2 Years
- 3 **PREREQUISITES:** The candidate must be currently certified in CPR and possess an
4 EMT-B License.
- 5 **CLASSROOM TRAINING:** Additional classroom training courses are required prior to
6 completion of this qualification card.
- 7 **SCOPE:** This qualification card must be completed by all candidates prior
8 to standing a watch unsupervised. Qualification is a six month
9 process. The individual may perform duties without direct
10 supervision only for those evolutions and/or operations for which
11 training has been completed.
- 12 All signatures must be made by an approved Subject Matter
13 Expert. The signatures indicate that the trainee has demonstrated
14 satisfactory knowledge and performance of the task (s) indicated.
- 15 **REFERENCES:** Emergency Services Technician Qualification Card Guide Book
16 (EST-01G)
17 WIPP Emergency Management Program (WP 12-9)

18 **QUALIFICATION CARD DESCRIPTION (by category)**

19 **1. Knowledge Requirements**

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

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

1 **2.** Practical Requirements

2 Demonstrate competency in the following areas:

- 3 ● Use of fire suppression apparatus and equipment.
- 4 ● Use of rescue apparatus and equipment.
- 5 ● Inspection and testing techniques and completion of corresponding forms.
- 6 ● Operation of ambulance and operation and application of all ambulance equipment
- 7 and supplies.
- 8 ● Application of all hazardous materials equipment and supplies for control and
- 9 mitigation.

1 **QUALIFICATION CARD:** Quality Assurance Inspector

2 **DURATION:** Six to nine months

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

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

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

12 **QUALIFICATION CARD DESCRIPTION (by category)**

13 **1. General Knowledge**

14 Demonstrate knowledge of the minimum site specific procedures:

- 15 ● ASME NQA-1
- 16 ● Quality Assurance Program Description
- 17 ● Safety Manual
- 18 ● Hoisting and Rigging Procedures
- 19 ● Work Authorization Procedures
- 20 ● Document Control Procedures

21 **2. On-the-Job Training**

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

- 24 ● Receiving inspection
- 25 ● Dimensional inspection
- 26 ● Mechanical inspection
- 27 ● Electrical inspection
- 28 ● Civil inspection

1 **3.** Qualification Card

2 Perform the following tasks:

- 3 ● Receipt inspection
- 4 ● Conduct an inspection
- 5 ● Hold/witness point inspection
- 6 ● Issuance of a corrective action request
- 7 ● Hold tag issuance
- 8 ● Verification of corrective action
- 9 ● Conduct a corrective action receipt inspection

1 **QUALIFICATION CARD:** Facility Operations Roving Watch

2 **DURATION:** Six to nine months

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

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

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

21 **QUALIFICATION CARD DESCRIPTION** (by category)

22 **1.** System Knowledge

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

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

28 The systems covered include:

- 29 ● Facility electrical and backup electrical systems
30 ● Heating, air conditioning, and ventilation systems
31 ● Underground ventilation systems
32 ● Domestic water and fire protection systems

- 1 **2. System Operation Practical Evaluation**
- 2 Demonstrate system startup/shutdown for the various facility systems according to
3 procedures.
- 4 Demonstrate maintenance of applicable records pertaining to the operation of facility
5 systems.
- 6 Demonstrate ability to conduct periodic required testing of facility systems.
- 7 Demonstrate competency to respond to alarms and emergency situations according to
8 procedures.
- 9 **3. Integrated Plant Knowledge**
- 10 Discuss the site policies on equipment lockout/tagout.
- 11 Discuss the process of notifications and authorizations that is involved in making
12 temporary plant modifications.
- 13 Discuss the site process for work authorization.
- 14 Discuss the role and responsibilities of Facility Operations on the site.
- 15 Discuss Conduct of Operations as it applies to Facility Operations.
- 16 **4. Integrated Plant Practical Evaluation**
- 17 Demonstrate the lockout/tagout process.
- 18 Prepare paperwork associated with a temporary plant modification.
- 19 Demonstrate ability to maintain the Facility Operations logs.
- 20 Demonstrate the actions that are taken in various facility emergencies.
- 21 Demonstrate ability to stand watch as RW during various shifts.
- 22 **5. Oral Qualification Exam**
- 23 This final portion of the qualification consists of an oral board exam conducted by board
24 members who are knowledgeable in the qualification program areas.

- 1 **QUALIFICATION CARD:** Central Monitoring Room Operator
- 2 **DURATION:** Three to five months
- 3 **CLASSROOM TRAINING:** Various classroom courses are utilized to reinforce the training
4 received as part of the qualification card. The candidate is
5 required to complete the classroom training courses, satisfactorily,
6 prior to completion of the qualification card.
- 7 **SCOPE:** The Facility Operations Central Monitoring Room Operator
8 Qualification (FO-CMRO-2) in conjunction with the Roving Watch
9 qualification make up the support for the Facility Operations Shift
10 Engineer Qualification (FO-FOSE-3). This qualification is used by
11 Facility Operations personnel qualifying as CMR operators or
12 Facility Operations Shift Supervisors. All of the requirements of
13 the applicable qualifications must be completed by the candidate
14 prior to operating any equipment or performing any operating
15 evolutions without direct supervision of a qualified operator.
16 Qualification are valid for two years.
- 17 **REFERENCES:** Central Monitoring Room Operator Qualification Card (FO-CMR-2)
18 WIPP Operations Watchstation Qualification Card Guide Book (FO-GUIDE-1)

19 **QUALIFICATION CARD DESCRIPTION (by category)**

20 **1. System Knowledge**

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

- 23
 - Theory of the system and equipment
 - System design
 - Alarms and sequence of actions that follow the alarms

26 **2. System Operation Practical Evaluation**

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

- 29
 - System status
 - Alarm Status
 - Meteorological data

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

33 Demonstrate storage of information and subsequent retrieval.

34 **3. Integrated Plant Knowledge**

- 1 State the actions that must be taken to remove a CMS point scan/alarm check.
- 2 Discuss the sequence of events that must occur during a facility emergency.
- 3 **4. Integrated Plant Practical Evaluation**
- 4 Demonstrate how the CMR log is maintained.
- 5 Demonstrate the sequence of events that are involved in CMS point scan/alarm check
6 removal.
- 7 Demonstrate ability to stand watch as CMRO during different shifts.
- 8 Demonstrate the sequence of events involved in a facility emergency.
- 9 **5. Oral Qualification Exam**
- 10 This final portion of the qualification consists of an oral board exam conducted by board
11 members who are knowledgeable in the qualification program areas.

1 **QUALIFICATION CARD:** Facility Operations Shift Supervisor

2 **DURATION:** Three to five months

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

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

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

21 **QUALIFICATION CARD DESCRIPTION** (by category)

22 **1.** System Knowledge

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

25 **2.** System Operation Practical Evaluation

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

- 1 **3.** Integrated Plant Knowledge
- 2 Discuss the site work authorization process and the role of the FSM.
- 3 Discuss the use of operator aids.
- 4 Discuss the responsibilities of the FSM.
- 5 Discuss the use of shift instructions.
- 6 Discuss the role of the FSM in facility emergencies and the actions that are to be taken by
- 7 the FSM.
- 8 Discuss the role of the Quality Assurance and Safety programs on the site.
- 9 Discuss the Contingency Plan and its implementation.
- 10 Discuss site regulatory compliance as it applies to hazardous waste and hazardous
- 11 materials.
- 12 **4.** Integrated Plant Knowledge Evaluation
- 13 Complete the required documentation for a lockout/tagout.
- 14 Complete the proper documentation relating to temporary plant modifications.
- 15 Perform various work authorization actions.
- 16 Demonstrate a review of the Facility Operations logs.
- 17 Demonstrate the response required for various facility emergencies.
- 18 Demonstrate ability to stand watch as FSM during different shifts.
- 19 **5.** Oral Qualification Exam
- 20 This final portion of the qualification consists of an oral board exam conducted by board
- 21 members who are knowledgeable in the qualification program areas.

1 **QUALIFICATION CARD:** WWIS Data Administrator

2 **DURATION:** Two years

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

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

15 **REFERENCES:** WWIS Data Administrator Qualification Card

16 **QUALIFICATION CARD (by category)**

17 **1. Equipment Knowledge Requirements**

18 Demonstrate knowledge of the following WWIS hardware and software systems:

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

22 **2. Equipment Operation Practical**

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

1 **3.** Integrated Process Knowledge Requirements

2 Demonstrate knowledge of the following project document data requirements:

- 3 ● WIPP Waste Acceptance Criteria
- 4 ● WIPP Quality Assurance Program Plan
- 5 ● Waste Analysis Plan

6 Demonstrate knowledge of the following WWIS Specific documentation:

- 7 ● WWIS Software Requirements Specification
- 8 ● WWIS Software Configuration Management Plan
- 9 ● WWIS Software Quality Assurance Plan
- 10 ● WWIS Software Design Description

11 **4.** Integrated Process Practical Requirements

12 Demonstrate competency in performing the administrative duties of the WWIS DA

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

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

1 **QUALIFICATION CARD:** Radioactive Transportation (TE-01)
2 Federal Motor Carrier Safety Regulations (TE-02)
3 Hazardous Materials (TE-03)
4 Hazardous Waste Shipments by Public Highway (TE-05)

5 **DURATION:** Six to twelve months

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

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

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

20 **QUALIFICATION CARD DESCRIPTION (by category)**

21 **1. Knowledge Requirements**

22 Demonstrate knowledge of the following regulatory arenas:

- 23 ● Radioactive Material Transportation
24 ● Federal Motor Carrier Safety Regulations
25 ● Hazardous Materials
26 ● Hazardous Waste Shipments by Public Highway

27 **2. Practical Requirements**

28 Demonstrate competency in performing the following for a given shipment:

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

1	QUALIFICATION CARD:	Sampling Team (ST-01)
2	DURATION:	1 month
3	PREREQUISITES:	HWW-101 - Hazardous Waste Worker/Hazardous Waste Responder
4		
5	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.
6		
7		
8		
9		
10	REFERENCES:	WIPP Sampling Team Qualification Guide ST-01G
11		WP 02-EC.05 Quality Assurance Project Plan for WIPP Site
12		Effluent and Hazardous Materials Sampling
13		WP 02-EC.06 WIPP Site Effluent and Hazardous Materials
14		Sampling Plan

15 **QUALIFICATION CARD DESCRIPTION (by category)**

16 **1. Knowledge Requirements**

17 Demonstrate basic knowledge of hazardous waste sampling protocol such as:

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

24 **2. Safety Requirements**

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

- 26 ● Level of personal protective equipment (PPE) needed for various sampling
- 27 situations
- 28 ● Actions to take when encountering damaged or bulging containers
- 29 ● Importance of the "Buddy System"

30 **3. Practical Requirements**

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

1	QUALIFICATION CARD:	Sampling Team Assistant (STA-01)
2	DURATION:	1 month
3	PREREQUISITES:	HWW-101 - Hazardous Waste Worker/Hazardous Waste Responder
4		
5	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.
6		
7		
8		
9		
10	REFERENCES:	WIPP Sampling Team Qualification Guide ST-01G
11		WP 02-EC.05 Quality Assurance Project Plan for WIPP Site Effluent and Hazardous Materials Sampling
12		WP 02-EC.06 WIPP Site Effluent and Hazardous Materials Sampling Plan
13		
14		

15 **QUALIFICATION CARD DESCRIPTION (by category)**

16 **1. Knowledge Requirements**

17 Demonstrate basic knowledge of hazardous waste sampling protocol such as:

- 18 ● Preventing cross-contamination of samples and equipment
- 19 ● Importance of the chain-of-custody
- 20 ● Purpose of the field logbook and documentation
- 21 ● Labeling and sealing procedures
- 22 ● Methods of obtaining various sample types (i.e., TCLP organics, volatile organic compounds, TCLP metals)
- 23

24 **2. Safety Requirements**

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

- 26 ● Level of personal protective equipment (PPE) needed for various sampling situations
- 27
- 28 ● Actions to take when encountering damaged or bulging containers
- 29 ● Importance of the "Buddy System"

30 **3. Practical Requirements**

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

1 **QUALIFICATION CARD:** Waste Handling Hoist Equipment Operator

2 **DURATION:** Approximately 12 to 15 months

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

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

11 **QUALIFICATION CARD DESCRIPTION** (by category)

12 **1. Equipment Knowledge**

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

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

18 **2. Equipment Safety**

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

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

22 **3. Equipment Practical**

23 Perform normal startup and shutdown of all Waste Hoist systems.

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

25 **4. Classroom Training**

26 Receive formal training in electrical safety.

27 **5. Required Reading**

28 Read the appropriate related procedures for waste hoist operation.

1 **QUALIFICATION CARD:** Waste Handling Shaft Tender Operator

2 **DURATION:** Approximately 7 months

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

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

11 **QUALIFICATION CARD DESCRIPTION (by category)**

12 **1. Equipment Knowledge**

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

- 14 ● Waste Shaft controls
- 15 ● Communication systems
- 16 ● Conveyance control panels
- 17 ● Cage and its capacity

18 **2. Equipment Safety**

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

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

23 **3. Personnel Safety**

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

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

28 **4. Equipment Maintenance**

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

30 **5. Equipment Practical**

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

- 1 Perform all record keeping duties of the shaft tender.
- 2 Demonstrate proper operation of the Local Control Stations, Pivot Rail System, and Bell
- 3 Systems.